Final

Environmental Impact Report

M.B.T.A. Alewife Station
Interim Access
Arlington and Cambridge, Ma.

EOEA # 4931

August, 1984

Submitted In Compliance With
General Laws : Chapter 30 Section 62
by the M.B.T.A.

Sverdrup

Sverdrup & Parcel and Associates

Engineers-Architects-Planners

FINAL
ENVIRONMENTAL IMPACT REPORT
MBTA ALEWIFE STATION
INTERIM ACCESS

EOEA #4931

SUBMITTED IN COMPLIANCE WITH
GENERAL LAWS
CHAPTER 30 SECTION 62

PREPARED FOR
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

BY
SVERDRUP & PARCEL AND ASSOCIATES, INC.
IN ASSOCIATION WITH
SEGAL DISARCINA ASSOCIATES - TRAFFIC
TECH ENVIRONMENTAL - AIR QUALITY
MASON & FREY - LANDSCAPE ARCHITECTURE

AUGUST 1984

SUMMARY

The Northwest Red Line Extension and Alewife station is scheduled to open in 1985.

During the period when the Alewife transit station and garage were being planned, the Massachusetts Department of Public Works was concurrently planning a major highway improvements project for the Route 2/Alewife Brook Parkway corridor. The MDPW project proposed to provide direct ramps to the transit station/garage from Route 2. The highway improvements project, experiencing many delays, is currently in the environmental analysis stage.

In the 1977 Red Line EIS, it was stated that Alewife station could operate with access from local streets. Road improvements proposed as part of the Red Line project were, at the time, deemed adequate to service station and garage traffic alone.

In the years since the Red Line EIS analysis was performed, extensive land development activity has and is continuing to occur at Alewife. Major new office space is under construction and planning is actively underway on other large projects in the immediate station area. Public concern over opening the new Alewife Station and 2,000 car garage, with the highway improvements several years from implementation, has lead the State to re-examine the ability of the station to function without additional access improvements.

In March 1984, a Draft Environmental Impact Report was issued on a proposal to provide interim access to the station until the major permanent highway improvements would be built. The report listed a number of alternatives including No Build. On the advice of the Alewife Transportation Advisory Committee, the Secretary of Transportation and Construction has selected Alternative 4 as the preferred alternative for providing the interim access to the Alewife/Station Garage.

The proposed Interim Access alternative selected consists of a separate inbound and outbound station ramps, signalization of the Route 2 rotary, and providing new pedestrian and bicycle connections to the station. An inbound ramp would run from Route 2 at the Arthur D. Little complex across the Alewife Brook Reservation, adjacent to Route 2, and then run over the Lexington Branch Railroad Right-of-Way to the station then connecting to Rindge Avenue Extension. An outbound ramp would run from the West Roadway, under the Alewife Brook Parkway, across W. R. Grace property to a reconstructed signalized Dewey & Almy Rotary.

The major congestion intersections in the area are the Alewife Brook Parkway with the Concord Turnpike (Route 2) and with Rindge Avenue Extension. For the AM peak period in the 1987 analysis year, the preferred alternative will remove 1,223 vehicles form the Rindge Avenue Extension intersection with the total Parkway volume reduced to 2,613 vehicles. Thus, the Parkway volume is reduced by 37 percent. These substantial reductions would allow for relatively unimpeded access to the station.

This Final Environmental Report summarizes the Alternatives analysis process, describes the preferred alternative in detail, and responds to comments made on the Draft Environmental Impact Report.

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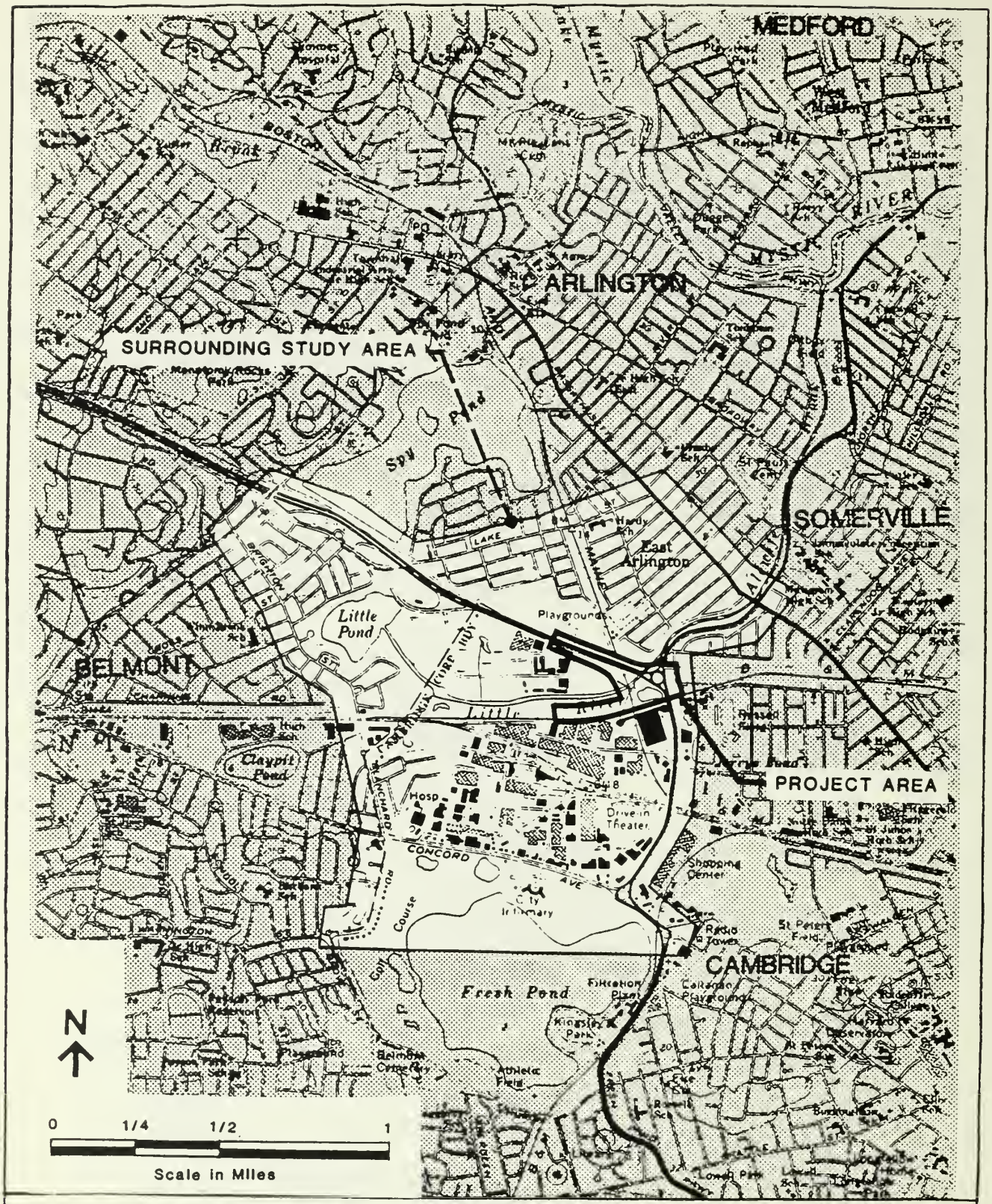


Locus Plan

Figure I-A

I PROJECT CONTEXT

The heavily used Red Line rapid transit subway is currently being extended from Harvard Square to a new terminal and 2,000 car parking garage at Alewife Brook Parkway. This location was selected because it is a logical inter-modal transfer point near the junction of Route 2 and Alewife Brook Parkway. Route 2 is a major radial route serving the northwest quadrant of the Boston metropolitan region. Alewife Brook Parkway is a link in a circumferential set of parkways looping the Boston area (Figure I-A)..

The station is located in an area where a major eight-lane expressway must transition into a four-lane parkway system. At this time the transition is abrupt and unsafe. High traffic volumes overwhelm the area roadway network resulting in congested operations, particularly during peak hours.

In addition, the station is located in an environmentally sensitive area. The station is within a 100-year flood plain which experiences frequent flooding. It is adjacent to wetlands and abuts the Metropolitan District Commission's Alewife Brook Reservation.

During the period when the Alewife transit station and garage were being planned, the Massachusetts Department of Public Works was concurrently planning a major highway improvements project for the Route 2/Alewife Brook Parkway corridor. Along with highway safety and access improvements, the MDPW project proposed to provide direct ramps to the transit garage from Route 2. The goal was to construct the transit and roadway projects simultaneously. However, the Red Line Extension and Alewife station plans have been implemented, with the inauguration of service scheduled for 1985. The highway improvements project, experiencing many delays, is currently in the environmental analysis stage.

In the 1977 Red Line EIS it was stated that access to the Alewife parking garage would be from existing streets. To assist the station and garage to function within the existing roadway network, the Alewife station project incorporated some improvements to the Rindge Avenue intersection and one of the Parkway bridges. Road improvements proposed as part of the Red Line project were, at the time, expected to be adequate to service station and garage traffic alone.

In the years since the Red Line EIS analysis was performed, extensive land development activity has and is continuing to occur at Alewife. Major new office space is under construction and planning is actively underway on other large projects in the immediate station area. In 1977 land development plans for the Alewife area were only on paper. Today, in the Triangle area alone, a steel fabricating shop has been converted to a multi-story office building and is occupied; a second office building has been completed and is available for occupancy and two more are in the design stage. Access to all these developments is also solely via the Alewife Brook Parkway/Rindge Avenue intersection.

In addition to local traffic volumes, through traffic is steadily increasing resulting in heavy peak-period congestion and traffic diversions to local streets.

Public concern over opening the new Alewife Station and 2,000 car garage, with the highway improvements several years from implementation, has lead the State to re-examine the ability of the station to function without additional access improvements. The Executive Office of Transportation and Construction (EOTC) decided to evaluate the need to provide improved access to the station and garage, to serve on an interim basis until improvements to Route 2 and permanent access to the garage could be provided.

The basic objectives of any interim improvements would be to assure maximum station accessibility for cars, buses and pedestrians and to insure that station operations do not exacerbate existing traffic congestion in the immediate area.

This evaluation has focused particularly on traffic benefits, prospects for early implementation, environmental impacts and costs. The MBTA was directed by the EOTC to serve as the agency responsible for conducting the evaluation. the MBTA has prepared and circulated a Draft Environmental Impact Report and comments have been received.

This Final Environmental Impact Report responds to those comments and includes a more detailed analysis of the preferred alternative selected.

II THE ALTERNATIVES ANALYSIS PROCESS

A. EVALUATION CRITERIA

Several objectives and criteria were established to guide the development of this project:

1. The basic purpose of the interim improvements is to optimize functioning of and maximize access to the MBTA station and garage.

2. The interim improvements should provide for the flow of pedestrians and bicyclists between the station and surrounding residential neighborhoods and places of employment.

3. The interim improvements should, to the extent possible avoid points of high existing congestion as they channel station generated traffic.

4. The interim improvements should be able to be implemented as soon as possible, preferably in time for the garage opening.

5. The interim improvements should be built at the lowest possible cost.

6. The interim improvements impacts on the MDC Reservation, on wetlands and on the flood plain's capability for retaining flood waters are essential elements in the evaluation of the alternatives.

7. Although the primary purpose of the interim improvements is to serve station generated traffic, their design should be adequate to absorb both the Alewife station garage and area development traffic which may find use of the interim improvements more convenient than any alternative available routes during the interim period.

8. Any temporary roads should facilitate rather than impede the earliest possible completion of permanent road improvements.

9. As per directive from MEPA, update development assumptions made in previous EIR as a basis for the traffic projections for this project. See Table II-A.

B. TRAFFIC ANALYSIS

The AM and PM high peak hour traffic flows present the most problematic traffic operations conditions at Alewife--particularly as it relates to the optimum functioning of the new transit facility. Traffic analyses confirm that the major points of congestion are and will continue to be the Rindge Avenue Extension/Alewife Brook Parkway intersection and the Route 2 rotary. Calculations show that the intersections--particularly at Rindge, are operating at over capacity conditions. Demand projections indicate future traffic volumes at these intersections will increase. The right-turn volumes into Rindge Avenue Extension in the morning and the left turn out of Rindge in the evening were found to be the predominant constraints on the station/garage operations. Thus

MBTA Alewife Station, Interim Access Roadway Study

Table II-A

Proposed Development Quantities

	City of Cambridge Draft EIR #4326		Spaulding & Slye Draft EIR #4512		Spaulding & Slye Final EIR #4512		MBTA Interim Access Proposed Quantities	
	1984	1987	1984	1987	1984	1987	1984	1987
Triangle - Other	na	50	15	50	15	190	50	190
Triangle - Cmbg Park	na	670	183	670	183	670	183	670
Triangle - Total	na	720	198	720	198	860	233	860
Quadrangle	na	230	50	230	50	230	100	230
Grace - Office	na	200	50	200	50	0	100	200
Grace - Hotel	na	150 rms	0	150 rms	0	0	0	150 rms
Mugar	na	360	200	360	200	360	0	0
A.D. Little	na	50	0	200	0	0	0	200
Office totals	na	1,560	498	1,710	498	1,450	433	1,490
Hotel totals	na	150 rms	0	150 rms	0	0	0	150 rms

Notes: All office quantities are shown as 1,000 sf

The 1987 quantities include the 1984 quantities

The City of Cambridge's draft EIR did not make estimates for 1984

any efforts to maximize station accessibility for transit users arriving by park-ride, kiss-ride or bus modes needed to focus on: (1) providing alternate access routes which bypass these congestion points; (2) increasing the capacity of the intersections for handling traffic; and/or (3) reducing the amount of traffic travelling through the critical congestion points.

C. EVALUATION PROCESS

An Alewife Transportation Advisory Committee (ATAC) was formed September 1984 to advise the Executive Office of Transportation and Construction, the Massachusetts Department of Public Works, and the Massachusetts Bay Transportation Authority as they proceeded with their transportation plans for the Alewife area. The ATAC members represented the following groups and agencies:

- Town of Arlington
- Town of Belmont
- City of Cambridge
- Alewife area business organization
- Environmental organization
- Legislative appointments for:
  - Arlington
  - Belmont
  - Cambridge
- Joint Regional Transportation Committee
- Metropolitan Area Planning Council
- Executive Office of Transportation and Construction

A listing of the ATAC members and their affiliations is found in Appendix C.

The Environmental Notification Form filed for this project identified two conceptual alternatives for accomplishing the goal of providing interim access. The first of these, Alternative 1, involved an alignment from the Alewife Station and Garage complex northerly over the existing subway tunnel then westerly across a parking area used by A. D. Little to Acorn Park Road, which runs northerly to Route 2. The second alignment identified in the Environmental Notification Form ran northerly on structure from the station and garage complex over the existing subway tunnel directly to Route 2. This option is identified as Alternative 2. The scope for the Environmental Impact Report issued by the Executive Office of Environmental Affairs in October 1983 requested that in addition to the base case or No Build alternative, a third alignment be considered which would run easterly from the Station and Garage Complex along the former Fitchburg Freight Cut-off railroad right-of-way, under Alewife Brook Parkway and then northerly to a connection with Alewife Brook Parkway.

In considering the No Build, the two alternatives proposed in the Environmental Notification Form and the third proposed by the EOEA, the ATAC first recommended an expanded set of alternatives to consider:

No Build
1. MBTA R-O-W, A. D. Little Parking Lot and Acorn Park Road

1a. MBTA R-O-W at Grade and Parallel to Route 2
1b. Permanent Route 2 Inbound Ramp for Interim Two-Way Use
2. Structure on MBTA R-O-W to Route 2
3. Existing Haul Road to Whittemore Avenue
3a. Existing Haul Road to Dewey-Almy Circle
4. Combination of 1 and 3a
Median Ramp Alternative
Thorndike Loop Alternative

The ATAC met regularly and discussed all alternatives in detail. Detailed minutes of all meetings were kept and reviewed by ATAC members for accuracy. To assist the ATAC members in their deliberations, each alternative was subjected to technical analysis by the consultants and ATAC members were furnished with sketch plans, interim working memos and analysis matrices.

The Mystic River Watershed Association submitted a memo to ATAC requesting that a non-structural alternative be considered. This alternative consisted of a series of transportation system management actions designed to control traffic growth and movement until the permanent MDPW highway improvements were in place. This concept was discussed extensively and subjected to an analysis by the consultants.

A result of these committee deliberations, agreement was reached by the ATAC to retain the No Build and Alternatives 1, 2, 3a and 4 for further analysis. This continued analysis resulted in the preparation of the Draft Environmental Impact Report in which the retained alternatives were further defined and analyzed.

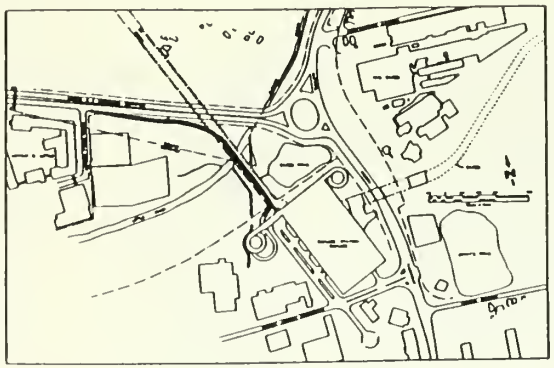
The DEIR was circulated, with comments received from fourteen agencies and individuals. Briefings were given to elected officials of all three abutting cities and towns and to their Conservation Commissions. The MAPC and JRTC were also briefed. During the DEIR public review period, the ATAC at its meeting of April 25, 1984 reached a consensus that Alternative 4 was its preferred alternative. The Mystic River Watershed Association was the single dissenting member. A copy of the minutes of that meeting is included in Appendix C.

D. ALTERNATIVES NOT RETAINED

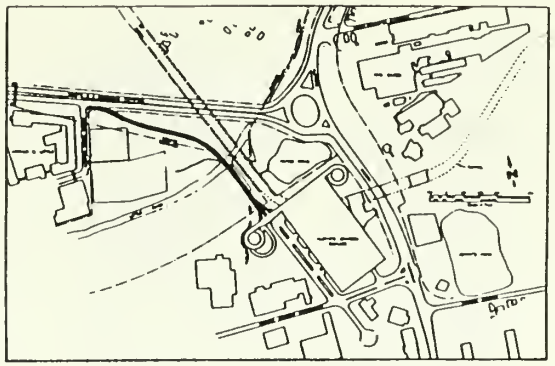
The Alewife Transportation Advisory Committee considered several alternatives, then based upon technical design work, traffic analysis and environmental considerations agreed to drop a number of them from further consideration. These alternatives were:

1a MBTA R-O-W at Grade and Parallel to Route 2
1b Permanent Route 2 Inbound Ramp for Interim Two-Way Use
3 Existing Haul Road to Whittemore Avenue
Median Ramp Alternative
Thorndike Loop Alternative

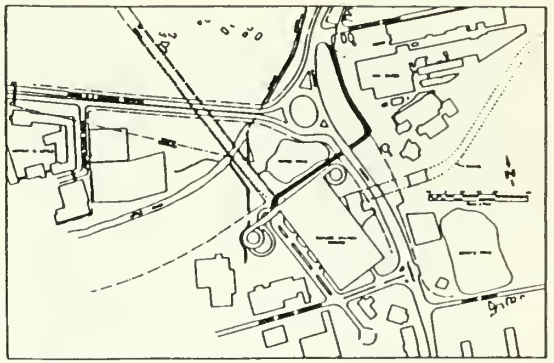
These alternatives are shown in Figure II-A. A brief description of them follows.



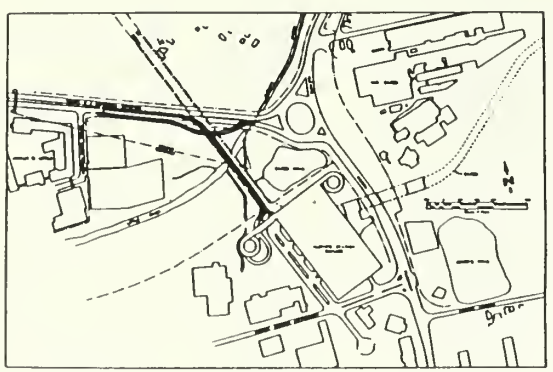
ALTERNATIVE 1a



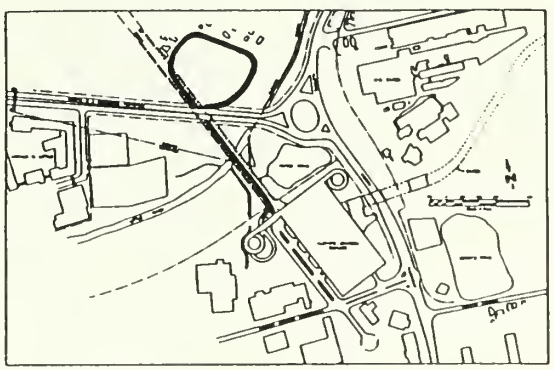
ALTERNATIVE 1b



ALTERNATIVE 3



MEDIAN RAMP OPTION



THORNDIKE LOOP ALTERNATIVE

Alternatives Not Retained

Figure II-A

ALTERNATIVE 1a - MBTA R-O-W AT GRADE AND PARALLEL TO ROUTE 2

A two-lane at-grade roadway extending northerly from the Alewife Garage West Roadway, crossing the Little River on a temporary structure over the in-place subway structure, then turning westerly along the Route 2 embankment, joining Route 2 at a temporary signalized oblique intersection. Westbound Route 2 traffic would not require signalization; it would merge with westbound traffic from the temporary roadway after the latter has emerged, on the left, from a parallel acceleration lane. Peak hour Route 2 traffic queuing would occur only on the inbound side.

The oblique intersection design was considered by the MDPW and the City of Cambridge to be a safety hazard which should be avoided. The ATAC felt that an alignment should be sought which would (1) permit a right-angle intersection and (2) provide a less constrained construction site for the proposed permanent inbound access ramp and the reconstruction of Route 2.

ALTERNATIVE 1b - PERMANENT ROUTE 2 RAMP FOR INTERIM USE

A permanent two-lane roadway extending northerly from the Alewife Garage West Roadway on the alignment previously proposed by the MDPW for its proposed permanent inbound station ramp. It would be on a low structure across the Little River and the wetlands, and its alignment parallel to Route 2 would be southerly enough to permit later relocation of the inbound Route 2 lanes by the MDPW. The intersection with Route 2 would be temporary, similar to Alternative 1a, to permit interim two-way operation. Thus, traffic impacts would be comparable to Alternative 1a.

This alternative consists of a temporary two-way signalized intersection with Route 2 and permanent ramps which eventually would become one-way inbound. Under these circumstances the alternative is not fully divorced from the later highway project, raising questions of segmentation, leaving design questions to be resolved as part of the road project and reducing the flexibility available for the later project. Construction costs would be higher than for Alternative 1a with no improvement in the critical Route 2 signalized intersection.

ALTERNATIVE 3 - EXISTING HAUL ROAD TO WHITTEMORE AVENUE

A two-lane roadway generally at the present grade and on the present alignment of the Haul Road from the Alewife Garage West Roadway to a temporary signalized intersection at Whittemore Avenue and Alewife Brook Parkway. The roadway would pass under the Parkway through a culvert with a 12 foot clearance being installed as part of the Red Line Station/Garage project.

Outbound station (and triangle development) traffic destined for Route 2 and Alewife Brook Parkway north would be served. AM returning buses and kiss-ride vehicles could also use it. The signal would cause queuing of northbound Parkway traffic and a backup into Dewey-Almy Circle during the PM peak. All inbound station (and triangle development) traffic would continue to use the Rindge Avenue intersection.

This alternative was considered unacceptable because it would have caused increased traffic at Whittemore Avenue; it is the only alternative which would encourage traffic to filter through on local residential streets to Massachusetts Avenue; and it is the only alternative, other than the No Build, which would provide no relief to the AM turning movements at Rindge Avenue extension.

MEDIAN RAMP ALTERNATIVE - PERMANENT ROUTE 2 RAMPS AND MBTA R-O-W AT GRADE

A permanent two-way two-lane road at grade on the MBTA R-O-W northerly to Route 2 then rising westerly to join Route 2 on a widened median, with one lane inbound and one lane outbound.

The outbound acceleration lane and the inbound deceleration lane would be to the left of the respective Route 2 passing lanes, a potential traffic hazard. Inbound and outbound station traffic would have their respective lane on the ramp available around the clock, but would be restricted to a single lane in each direction.

Because Route 2 construction would be required in advance, substantially delaying the construction of the ramps until the highway environmental analysis and design process were completed. The ATAC did not consider this alternative to be an interim solution.

SPAULDING & SLYE PROPOSAL - MBTA R-O-W TO THORNDIKE STREET AND RIGHT HAND LOOP TO ROUTE 2

A permanent at-grade roadway extending northerly from the Alewife Garage West Roadway over the MBTA R-O-W to Thorndike Street, thence easterly in Thorndike Street and the old Lexington Branch-Freight Cut-off railroad right-of-way and ramping up on embankment to join Route 2 at the bridge over the MBTA R-O-W. An option is a smaller radius loop traversing the wetlands on structure. All outbound garage traffic destined for Route 2 would use this ramp. Inbound garage traffic would use the Parkway-Rindge Avenue access route.

Although this alternative would provide a good traffic solution, it is the only alternative that impacts the East Arlington neighborhood directly as well as the MDC Reservation and the wetlands north of Route 2. It thus introduces some additional impacts avoided by all other alternatives.

E. ALTERNATIVES RETAINED FOR DETAILED ANALYSIS

The deliberations of the Alewife Transportation Advisory Committee resulted in a set of five alternatives to be carried forward for more detailed analysis:

No Build
1 MBTA R-O-W, A. D. Little Parking Lot and Acorn Park Road
2 Structure on MBTA R-O-W to Route 2
3a Existing Haul Road to Dewey-Almy Circle
4 Combination of 1 and 3a

These alternatives are shown on Figure II-B and are described briefly below.

In addition, it was requested that the application of various transportation systems management techniques be evaluated to determine their effectiveness as a supplement to either the Build or No Build options. This approach is discussed in Section F.

NO BUILD

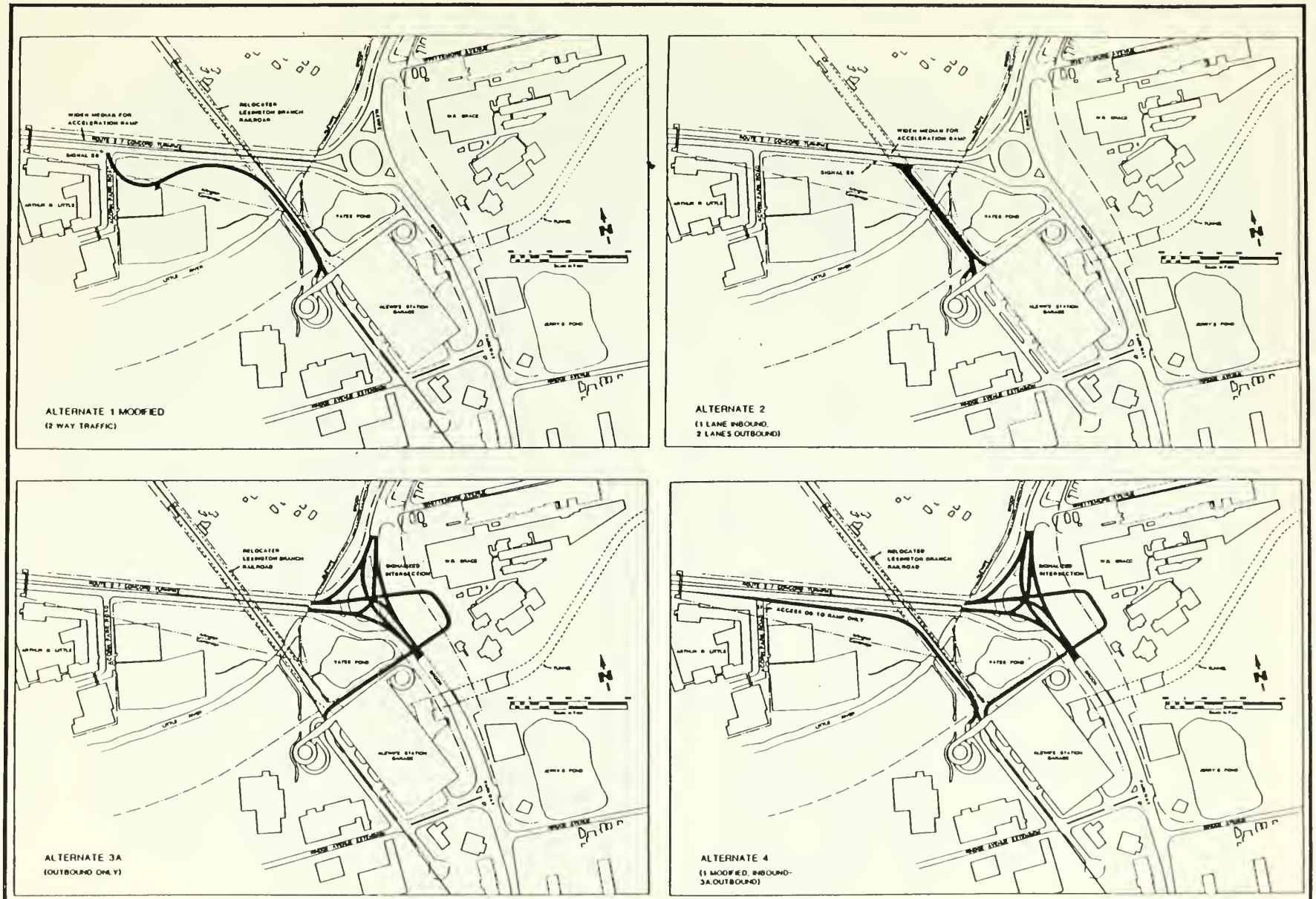
As with all projects undergoing environmental analysis, the EOEA scoping for the project required that the analysis of the No Build or existing conditions option also be carried through the evaluation process as a base case for comparison purposes. A further variation of the No Build concept has also been analyzed--the so-called "non-structural" alternative which involves implementing only transportation systems management techniques to address the traffic congestion problem at Alewife. This option is analyzed in Section II-F.

As a part of the Red Line construction, the MBTA has planned and is constructing a series of improvements to the street system abutting the new transit station. It is constructing a redesigned and improved intersection of Alewife Brook Parkway with Rindge Avenue and Rindge Avenue Extension, a relocated and improved Rindge Avenue Extension, a West Roadway serving the access points to the station/garage and a new undercrossing of Alewife Brook Parkway on the right-of-way of the former Fitchburg Frieght Cut-off railroad. The No Build alternative assumes both the garage and these street improvements are completed and operational.

The intersection improvements being made as part of the Red Line Extension Project include a third lane for right turns from the Parkway southbound into Rindge Avenue Extension, a third lane for left turns from the Parkway northbound into Rindge Avenue Extension, the relocation of Rindge Avenue Extension closer to the garage, the provision of two exiting lanes on Rindge Avenue, the provision of one right turn lane and two left turn lanes from Rindge Avenue Extension and a modern traffic signal system.

Selection of the No Build alternative would mean that all station and garage traffic would use the Alewife Brook Parkway-Rindge Avenue Extension intersection. Although the No Build is an attractive option in that it would not impact parklands or wetlands, traffic analysis revealed that the station and garage could not function efficiently. The AM peak hour right turn into Rindge Avenue Extension and the PM peak hour left turn out of Rindge Avenue Extension would be the critical traffic movements. Under the No Build alternative, 1,845 AM peak hour right turns would be required to meet the demands of the MBTA station and the triangle developments. A free flowing condition for the right turn movement would mean that the AM peak hour right turn movements should be limited to 750 vehicles.

It was clear to the ATAC that dependence on the No Build or existing conditions would not suffice. Relief of the congestion at the Rindge Avenue Extension-Alewife Brook Parkway intersection was needed.



Alternatives for Detailed Analysis

Figure II-B

ALTERNATIVE 1 - MBTA R-O-W, A. D. LITTLE PARKING LOT AND ACORN PARK ROAD

This alternative has the following characteristics:

It extends northerly over the MBTA subway from the Garage West Roadway and at the grade of that roadway, crossing the Little River on a temporary structure, and continuing to a point about 80 feet south of Route 2 where it curves to the west and rises until it parallels Route 2. It then drops and curves southerly into the northernmost bay of the A. D. Little parking lot where a new T intersection would allow access to A. D. Little. From that point the road continues west and curves northerly to right angle intersection with Route 2 at Acorn Park Road.

The intersection between the access road and Route 2 would be signalized. Westbound traffic from the garage would merge with westbound Route 2 traffic in two acceleration lanes extending westerly from the Acorn Park Road to a point near the pedestrian overpass over Route 2.

The access road would consist of one lane inbound and two lanes outbound between the Route 2 intersection and the relocated A. D. Little intersection. From that point to the station the road would provide for one lane in each direction.

This alternative would involve a signalized intersection at Route 2 and would reduce the number of A. D. Little parking spaces.

ALTERNATIVE 2 - STRUCTURE ON MBTA R-O-W TO ROUTE 2

Alternative 2 would be a three-lane roadway on structure over the MBTA subway, rising from the northerly end of the Alewife Garage West Roadway at a four percent grade until it reaches the elevation of Route 2 at its bridge over the MBTA R-O-W. Route 2 would be widened at the bridge by converting the two sidewalks to roadway pavement. This would permit the provision of a two-lane acceleration lane to extend westerly from the intersection, allowing a merge between westbound traffic from the garage and westbound Route 2 traffic. A traffic signal would be required to control eastbound Route 2 traffic. Lane use on the ramp would be one lane inbound and two lanes outbound. This configuration is possible because AM peak-hour garage traffic would queue in the garage drum, while PM peak-hour queuing would occur at the Route 2 signal. This alternative requires modifications to the existing Route 2 Bridge.

This alternative was specifically designed to avoid land taking from the MDC Reservation. However, the safety, traffic operations and constructibility problems were significant, raising questions about the prudence of this alternative.

Several safety issues were involved:

- The design would require the elimination of both existing sidewalks on Route 2.

- With relatively poor sight distances, drivers coming off a high-speed road would have to negotiate a right turn onto a down ramp located on a temporary structure.

- Located entirely on structure, both the intersection and ramp could encounter icing conditions in winter.

- A new intersection would be introduced at a point of poor sight distances, increasing the risk of rear end collisions.

- The new signalized intersection would be located very close to the rotary and potential problems of traffic queuing into the Rotary during PM peak hours were raised.

Another condition was considered to be significant to the ATAC in their downgrading of this alternative. The Route 2 bridge structure this alternative would convert into an intersection is in relatively poor condition. As long as the bridge was being used for interim access purposes, remedial actions would be made very difficult. This alternative would also likely impede the expeditious completion of permanent improvements.

A further concern noted by the Mystic River Watershed Association was that a temporary structure at this location would have a negative visual impact on the MDC Reservation.

ALTERNATIVE 3a - EXISTING HAUL ROAD AND W. R. GRACE PROPERTY TO DEWEY-ALMY CIRCLE

This alternative would make use of the former freight cut-off R-O-W subsequently used as a haul road during the construction of the Red Line Extension.

The access road would follow the R-O-W of the haul road at the present grade of the haul road from the northerly end of the Alewife Garage West Roadway easterly to the junction of the east-west haul road and the north-south haul road extending through W. R. Grace property. At that point it would turn northerly within W. R. Grace property to a point opposite the center of the Dewey-Almy Circle. There it would curve westerly and rise on fill to meet the grade of a modified Route 2-Alewife Brook Parkway intersection. The present circle would be replaced by a three or four-phase signalized intersection within the existing rotary right-of-way similar to other intersections built by the MDC to replace traffic circles.

The Red Line Extension project includes the replacement of the old Freight Cut-off bridge at Alewife Brook Parkway with an embankment and a culvert with a 12 foot minimum vertical clearance and a 22 foot minimum horizontal clearance. Alternative 3a would construct a roadway through the culvert.

The access road would be adjacent to Yates Pond for about 340 feet. Storm water drainage from the roadway into Yates Pond would be prevented (1) by the construction of a retaining wall on MBTA property between the road shoulder and Yates Pond and (2) by superelevating the roadway in order for

all roadway drainage to be collected in a gutter on the garage side of the roadway which in turn would be discharged into Alewife Brook at a point west of Yates Pond.

This alternative would serve only outbound garage traffic. Inbound traffic to the garage would use the right-turn lanes from Route 2 in the new intersection and from Alewife Brook Parkway to Rindge Avenue Extension.

ALTERNATIVE 4 - COMBINATION OF 1 AND 3a

Each of the above described alternatives found some favor with members of the Alewife Committee, and each were found wanting in some respects.

Alternative 1 provided the most direct route into the garage with little disturbance to Route 2 traffic and to wetlands and park lands. However as long as outbound traffic were to use it, an additional signal would be required on Route 2, with potential traffic operations problems and potential safety hazards.

Alternative 3a was also found attractive. It avoided a crossing of the major wetlands and MDC Reservation entirely. It also introduced the concept of a modified Alewife Brook Parkway-Route 2 intersection. A principal drawback, however, is that it made no provision for directly accommodating inbound garage traffic.

The ATAC recommended a combination of the two alternatives, with Alternative 1 accommodating inbound garage traffic and Alternative 3a providing for outbound garage traffic.

Alternative 3a could be used without change to become part of Alternative 4, but further modifications would be required in Alternative 1. The traffic signal and 90 degree intersection at Route 2 would no longer be required. The S-curve dipping the access ramp into the A. D. Little parking lot could be replaced by a deceleration lane beginning near the pedestrian overpass and continuing parallel to Route 2 as far as the MBTA R-O-W. This change also eliminated the wetlands impact of the ramp.

A. D. Little traffic from the west could turn into Acorn Park Road as it does today. To avoid conflicts with traffic on the ramp, outbound A. D. Little traffic would be prohibited from turning right into eastbound Route 2; instead it would use the access ramp. That traffic could then gain access to Alewife Brook Parkway and Route 2 west via the Rindge Avenue Extension-Parkway intersection, or by a turning lane into Alternative 3a just north of the northerly end of the Alewife Garage West Roadway. This feature would provide the U-turn movements presently allowed on the rotary.

A sidewalk and bikeway would be included to provide access to the A. D. Little Company and to the East Arlington neighborhood. Restoration of the Lexington Branch railroad line would be possible.

F. TRANSPORTATION SYSTEMS MANAGEMENT MEASURES

In addition to some build options, the ATAC considered the application of a series of transportation systems management techniques as a supplement to either the Build or No Build alternatives. At the request of the EOEA, a monograph on the subject was prepared and distributed to the ATAC for review and discussion. The monograph is attached as Appendix G. The ATAC discussion is included in Appendix C.

The monograph considered one set of TSM actions that could be undertaken by the MBTA in conjunction with the operation of the station and garage and another set that could be implemented by employers, building owners and managers and/or employees in the Alewife area.

The transportation systems management actions that could be taken by the MBTA relate to:

- Garage opening strategies
- Controlling use of garage by vehicle type
- Controlling use of garage by time of day
- Maximizing use of feeder buses
- Authorizing use of Alewife bus terminal by private carriers and community bus systems
- Developing a system of satellite parking areas
- Maintaining dependable subway service

The transportation systems management actions that could be taken by private parties include:

- Use of carpools, vanpools, shuttle buses, shared taxis and subscription buses
- Encouraging tenants with low demands for parking
- Controlling parking spaces by vehicle type
- Controlling parking by time of day
- Use of flexible work schedules

To be effective, these techniques require the sustained and widespread cooperation of Alewife area employers and building owners and managers as well as employees.

To help in the evaluation of the effectiveness of these measures if they were to be applied in the Alewife area, a study undertaken for the U. S. Department of Transportation by A. M. Voorhees, Inc. was consulted. That study, TSM, An Assessment of Impacts found that the most effective TSM actions are those that enhance the supply and attractiveness of transit and other high occupancy vehicles, that reduce the number of highway lanes available to general traffic and that make it difficult for auto drivers to find a place to park at their destination. The study also found that if all these classes of TSM actions were applied the reduction in vehicle miles traveled would be in the order of 12 percent.

In the Alewife context, the Voorhees study suggests that to be fully effective, the TSM controls must be applied region-wide. The important place to apply parking controls is in the regional core, and the transit improvements involved must serve the regional core.

These considerations led to the conclusion that an imposing set of Transportation Systems Management measures are already being applied at the Alewife area. These include the Red Line, the feeder bus system, the reduction in number of travel lanes available to traffic moving from Route 2 to Alewife Brook Parkway, and the stringent parking controls imposed by the City of Cambridge.

In addition, the full utilization of the Alewife Station/Garage is essential as a support of those TSM measures and as an additional measure that would be effective in reducing vehicle miles traveled. It was found that the garage and station can best function when served by direct means of access and egress which avoid the use of the critical Alewife Brook Parkway-Rindge Avenue Extension intersection.

Various ways of reducing the amount of traffic passing through that critical intersection were evaluated. To reduce that traffic to acceptable levels or to levels comparable to those achieved by the build alternatives, the TSM actions that would have to be imposed as a supplement to the No Build would include the prohibition of any vehicles with fewer than 3 occupants from the garage and triangle area and in addition that 40 percent of the people destined for the triangle area would come by transit.

Applying these extraordinary TSM measures contains several serious flaws:

1. Unless equally stringent controls are placed over freedom of movement on the street between Alewife and the regional core and over parking in the regional core, the low occupancy vehicles turned away from the garage would join the through traffic into the core and vehicle miles traveled would not be reduced.

2. There is no precedent for policing vehicle occupancy at an intersection with a v/c ratio of 1.35 during the peak period. But such policing would be required if low occupancy vehicles were to be prohibited from entering the triangle from Alewife Brook Parkway.

3. Justification for the assumption that the mode split could be increased from 30 percent to 40 percent has not been established.

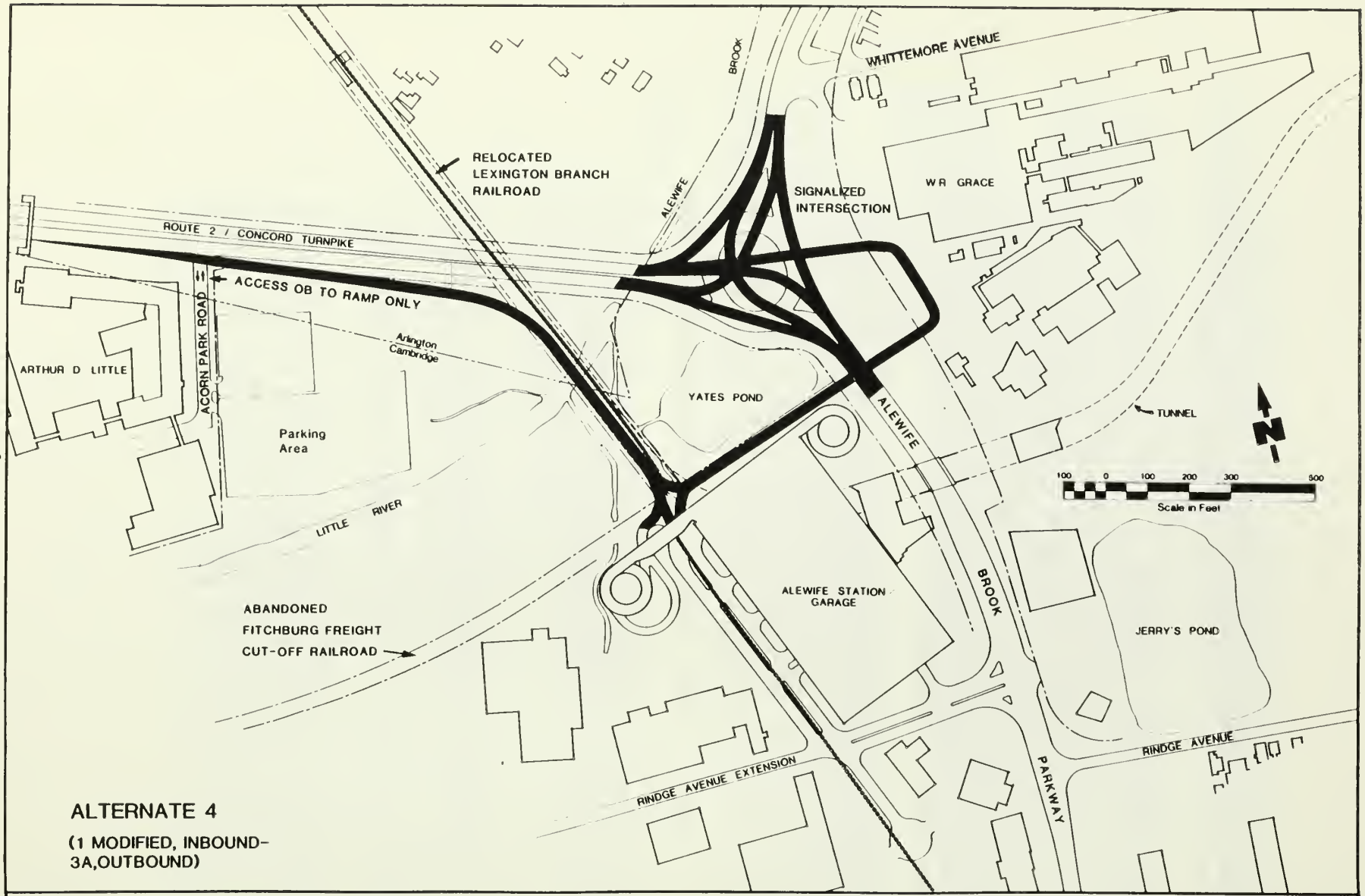
4. If the rate of flow of vehicles into the garage is reduced to 443 in the AM peak hour, (the figure necessary to permit a free flowing right turn movement at the Parkway-Rindge Avenue Extension intersection) the 2,000 spaces in the garage would not be filled during the AM peak period. This would result in empty garage spaces which would mean that prospective transit riders had been denied the opportunity. Thus, this strategy would be counter to the objective of encouraging transit use.

As a supplement to the Build option, it was found that the application of TSM measures that assure higher vehicle occupancy in autos entering the garage would be effective as a device to increase transit ridership.

G. SELECTION OF THE PREFERRED ALTERNATIVE

The Draft Environmental Impact Report was circulated to the list given in Section VI. Fourteen agencies and individuals submitted comments. Copies of their correspondence are contained in Section VII. The Secretary of Environmental Affairs issued a Certificate on the DEIS on May 11, 1984, contained in Appendix A. Following receipt and consideration of these documents, the Secretary of Transportation and Construction met with the Alewife Transportation Advisory Committee on May 15, 1984. He accepted the ATAC's recommendation and designated Alternative 4 as the Preferred Alternative. A copy of the minutes of that meeting is included in Appendix C.

A description of the Preferred Alternative (Figure II-C) and a description of the measures proposed to mitigate impacts on wetlands, parklands, flooding and traffic are contained in the following sections.



Preferred Alternative Figure II-C

III DESCRIPTION OF THE PREFERRED ALTERNATIVE

A. INBOUND RAMP

The widening of the Route 2 pavement to accommodate the inbound ramp will begin westerly of the foot bridge over Route 2. The ramp would become a separate roadway, with the nose of the divider between it and Route 2 located westerly of Acorn Park Road, prohibiting access from Acorn Park into Route 2.

As Route 2 rises to cross the bridge over the MBTA Lexington Branch R-O-W, the inbound ramp drops to the railroad level. Located on the existing Route 2 slope, the ramp would be separated from Route 2 by a retaining wall made up of soldier piles and concrete slat panels. The ramp would be separated from the wetlands beyond the toe of the existing slope by a lower "reinforced earth" retaining wall. Boston Ivy, Virginia Creeper and other vines would be planted on the higher wall. Where there is room, small caliper fast growing trees would be planted on the remaining strip between the ramp and Route 2, as well as seeding.

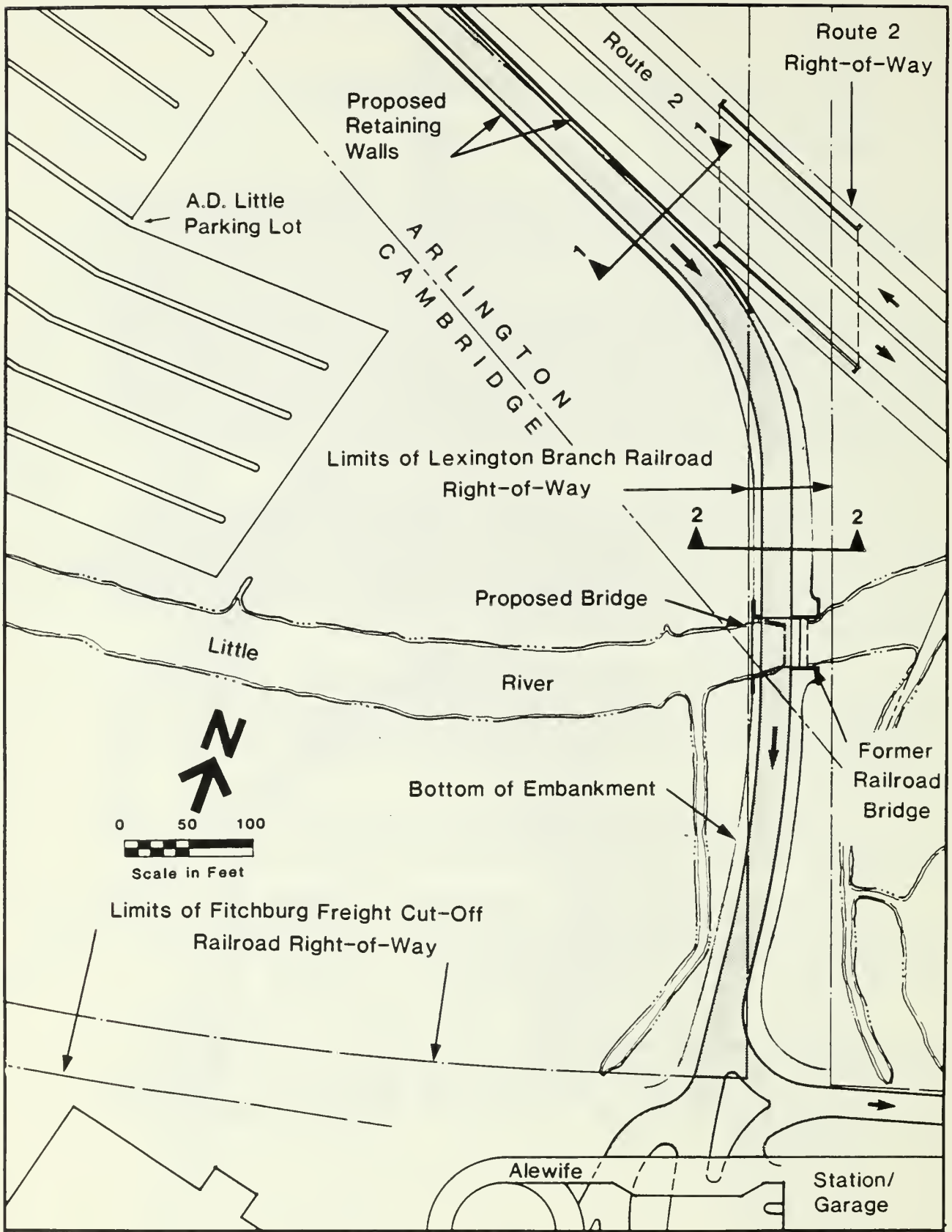
As the ramp nears the MBTA R-O-W it curves southerly and proceeds within the MBTA R-O-W over the Little River. Provision is also made within the MBTA R-O-W for the future restoration of the Lexington Branch railroad. In order to line up with the southbound lanes of the Alewife Garage West Roadway, the ramp curves slightly westerly after it crosses the Little River at a point 140 feet north of the MBTA freight cut-off right-of-way. This causes a small encroachment on the MDC Reservation.

After the ramp crosses the Little River, the lower retaining wall becomes a low embankment. Both sides of the ramp would then be sloped as far as the freight cut-off right-of-way. The slopes would be seeded and planted with low native shrub materials to blend with surrounding vegetation. In order to visually minimize the ramp's intrusion into the reservation, no tall trees would be planted here.

A right turn at the intersection of the two railroad rights-of-way gains access to the garage inbound drums. The inbound ramp is shown in plan in Figure III-A, and cross sections at two locations are shown in Figure III-B.

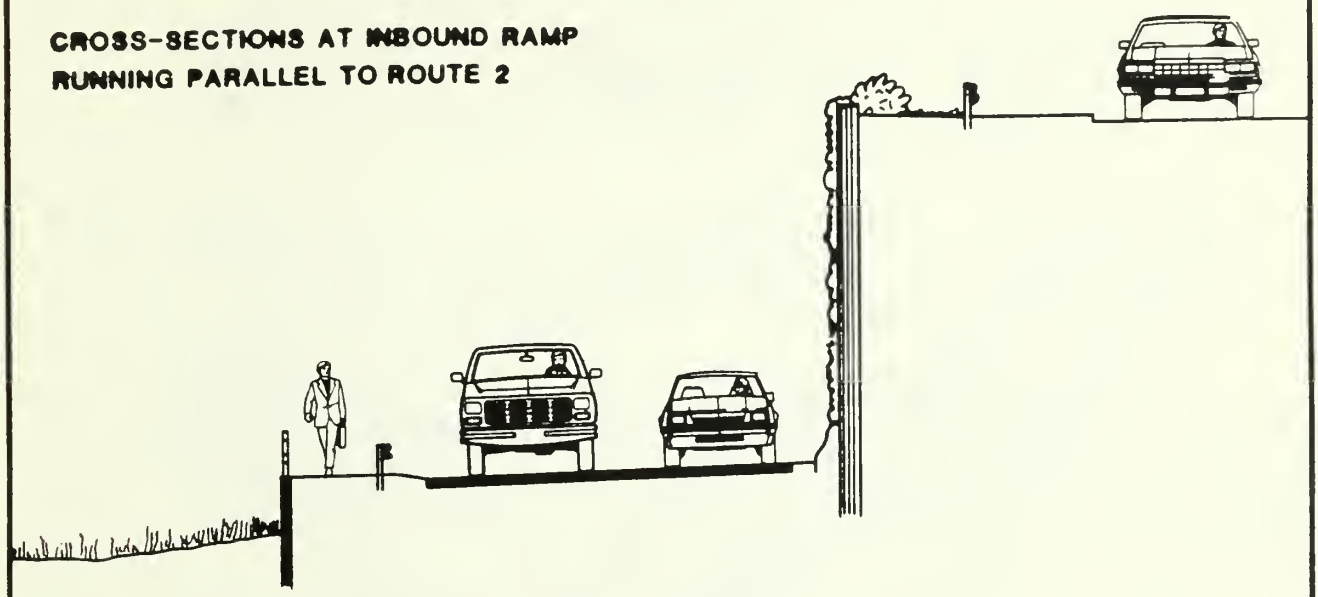
Since A. D. Little traffic is prohibited from making a right turn from Acorn Park Road into inbound Route 2, this traffic is accommodated by a left turn into a connecting lane between the inbound and outbound ramps located at the intersection of the two railroad rights-of-way. Inbound Route 2 traffic can also gain access to the W. R. Grace development by this movement.

In order to minimize the impact on the flood water storage capacity of the MDC Reservation, the inbound ramp is to be built at an elevation of 113.2 MBTA Base (7.3 MDPW Base), across the reservation. This is the 50-year flood level, so that should a 100-year flood occur during the useful life of the interim access ramp, it would be submerged as it crosses the Reservation and would be inoperative.



Preferred Alternative: Inbound Ramp Figure III-A

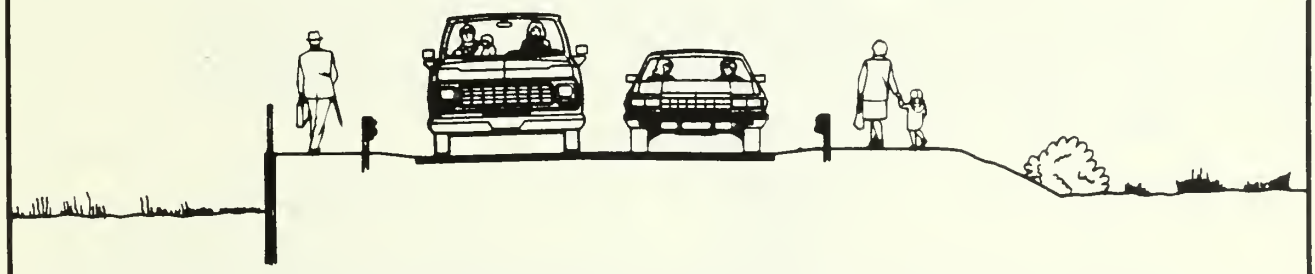
CROSS-SECTIONS AT INBOUND RAMP
RUNNING PARALLEL TO ROUTE 2



Section 1-1

0 5 10
SCALE IN FEET

CROSS-SECTION AT INBOUND RAMP
ON EXISTING RAILROAD RIGHT-OF-WAY



Section 2-2

Cross-Sections Figure M-B

B. OUTBOUND RAMP

Beginning at the intersection of the two railroad rights-of-way, the outbound ramp traverses the old freight cut-off R-O-W easterly to the W. R. Grace property line 500 feet easterly of centerline of the Alewife Brook Parkway. It would remain at the present grade of the haul road to that point, with the lowest elevation of 113 MBTA Base (7.1 MDPW Base). The existing underpass under the Parkway is being replaced as part of the Red Line project by a concrete culvert of adequate size to accommodate the roadway.

At the W. R. Grace property line the outbound ramp curves northerly and then curves westerly to join the Alewife Brook Parkway. Also within the W. R. Grace property, an access and egress road to the development continues easterly generally along the alignment of the haul road, forming a T intersection with the outbound ramp at the point it curves northerly.

Where the outbound ramp follows the southern edge of Yates Pond, it would be located as close to the Garage as possible to preserve the existing pond edge. A retaining wall would be located between the roadway and Yates Pond to minimize impacts. Special measures would be made to preserve the existing Peachleaf Willow at midpoint along the pond's southern edge. Debris (floating and nonfloating) at the southeast corner of Yates Pond would be removed. If damaged, the pond edge would be revegetated in kind.

The side slopes of the ramp from W. R. Grace to the Alewife Brook Parkway would be seeded with grass to blend with the existing grass slopes of the Parkway, and small caliper fast growing trees such as the Robusta Poplar used along the W. R. Grace property in the adjacent Alewife Station/Garage project.

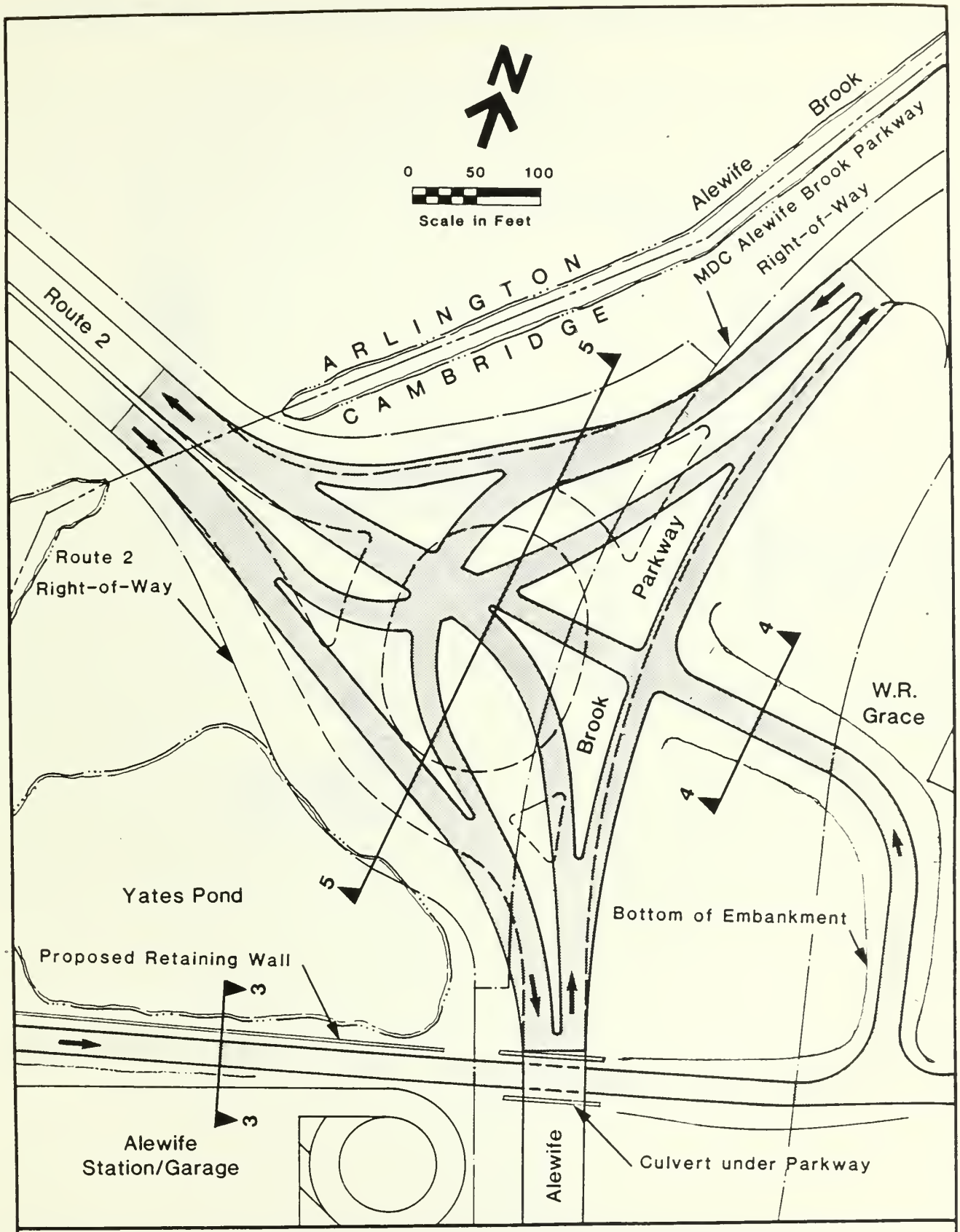
The outbound ramp and Parkway intersection at the rotary are shown in plan in Figure III-C and cross sections are shown in Figures III-D, III-E and III-F.

C. LAYOUT OF PARKWAY INTERSECTION

The signalized intersection shown in the DEIR replacing the rotary has been refined in design to assure adequate queuing capacity during the red cycle at each traffic signal and to comply with traffic and safety considerations.

These traffic and safety considerations are:

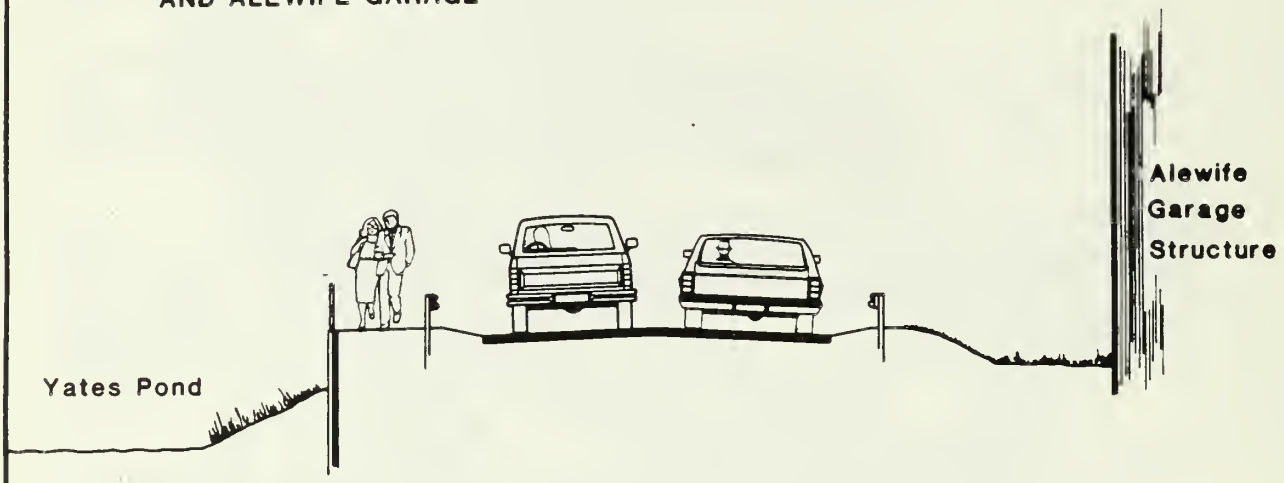
- All four of the signalized approach legs need two-lane approaches on the near side of the signal.
- The Alewife Brook Parkway southbound movement should continue as two lanes through the signal and then taper to one lane as it merges with the Route 2 movement.
- The Route 2 westbound movement (towards Massachusetts Avenue) should continue as two lanes through the signal and then taper to one lane as it merges with the Route 2 movement.



Preferred Alternative: Outbound Ramp & Rotary

Figure III-C

CROSS-SECTION AT OUTBOUND RAMP
BETWEEN YATES POND
AND ALEWIFE GARAGE



Section 3-3

0 5 10
SCALE IN FEET

Cross-Sections

Figure III-D

Cross-Sections

CROSS-SECTION AT OUTBOUND RAMP
APPROACHING INTERCHANGE

Section 4-4

0 5 10
SCALE IN FEET

Figure III-E

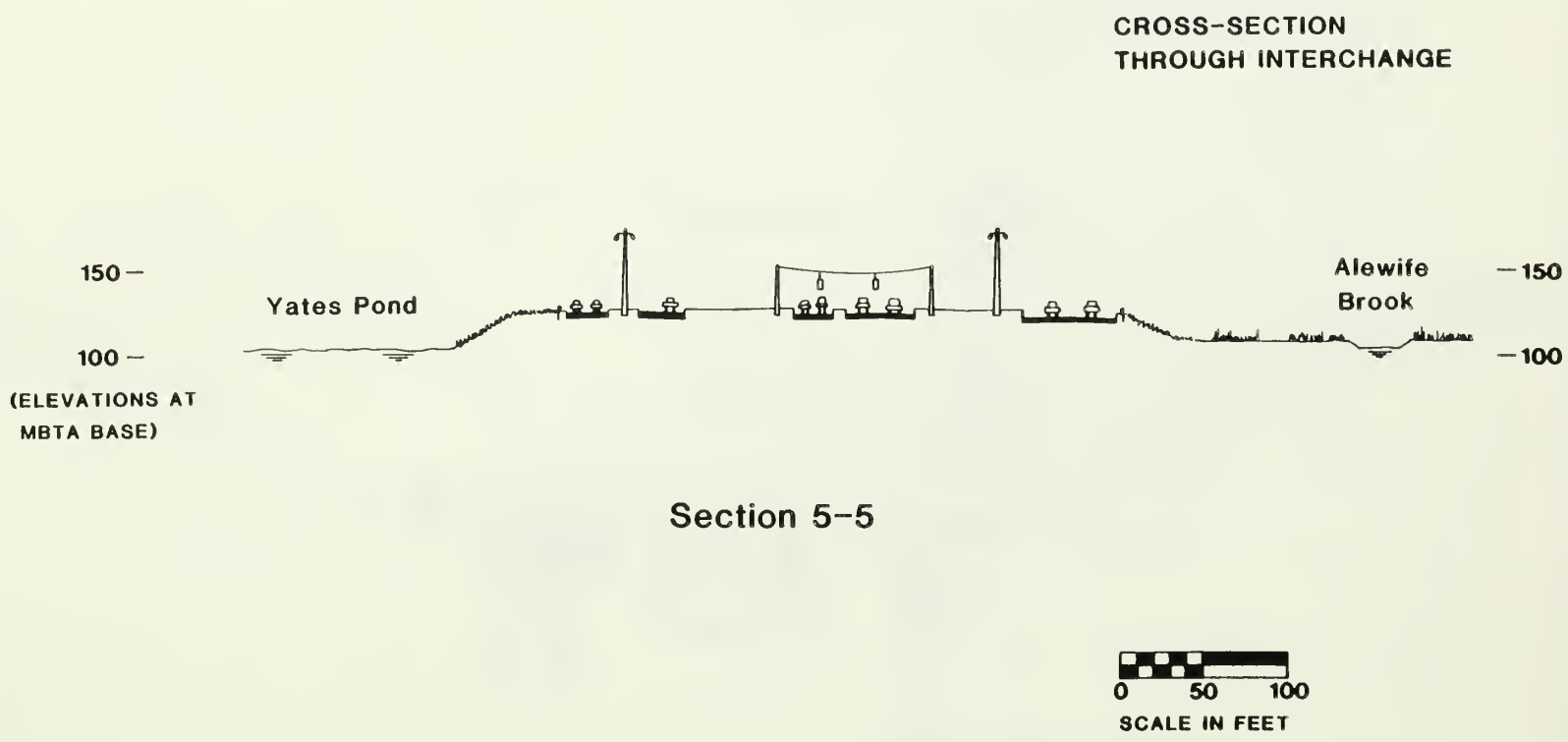

CROSS-SECTION
THROUGH INTERCHANGE
150
100
(ELEVATIONS AT
MBTA BASE)
Yates Pond
Alewife
Brook
150
100
Section 5-5
0
50
100
SCALE IN FEET

Figure III-F

- The outbound access roadway needs a two-lane approach at its first signal with Alewife Brook Parkway northbound, but then should taper to one lane as it proceeds towards Route 2 westbound.

- The Alewife Brook Parkway northbound to Route 2 outbound movement needs two lanes through the signal and, then merging with the one lane from the outbound access roadway, would flow into a three-lane section on the far side of the signal and then taper into two lanes as it proceeds towards Route 2.

- The existing rotary area is located in a warped, dish-like depression which needs to be raised slightly to improve grades and sight distances.

The redesigned signalized intersection, as shown in Figure III-C, has required the enlargement of the foot print of the existing rotary at three points generally as follows:

- The northbound Alewife Brook Parkway has been moved easterly extending from the crossing over the culvert carrying the outbound garage ramp northerly as far as Whittemore Avenue.

- The Parkway has been widened on the westerly side by 10 feet beginning at a point 180 feet north of the centerline of the outbound garage ramp and continuing southerly to join the already widened section of the Parkway.

- The pavement carrying the southbound to westbound traffic on the northerly side of the rotary would encroach on the existing shoulder.

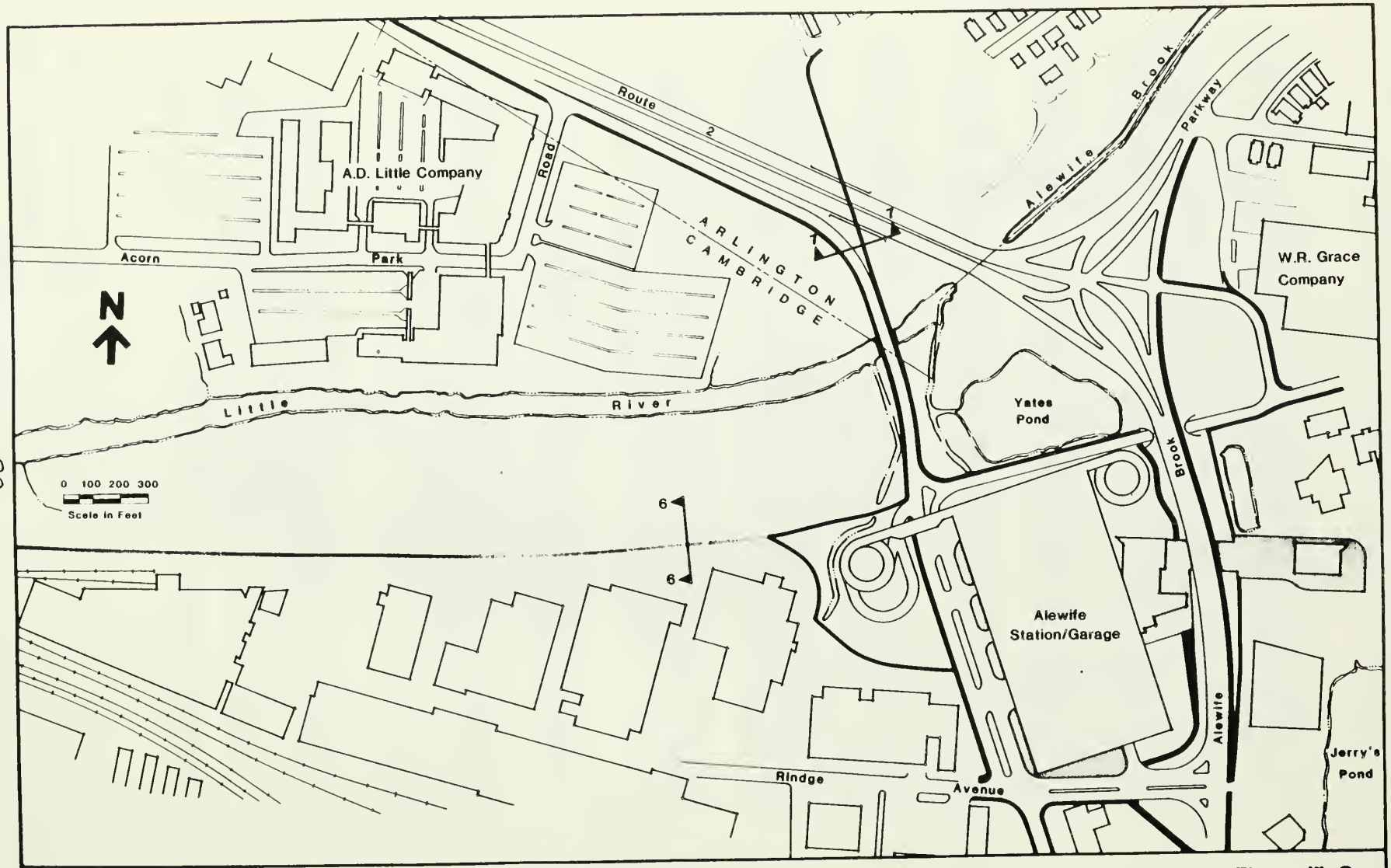
The geometric design made possible by these adjustments incorporates the following:

- The inbound Route 2-southbound Parkway movement has a minimum of two lanes of pavement throughout.

- The inbound Route 2-northbound Parkway movement has two lanes for storage at the signal, widening out from one-lane pavement 120 feet back at the throat of this left-turn lane. Similarly, after passing through the signalized intersection, the pavement tapers from two lanes to one lane in a distance of 220 feet before joining the northbound Parkway pavement.

- The northbound Parkway-outbound Route 2 pavement expands from one lane at the throat of the left-turn lane to two lanes at the traffic signal 200 feet away. Beyond the signalized intersection this movement enters onto a three-lane pavement shared by the outbound garage ramp traffic. This tapers to two lanes in a distance of 120 feet where this movement joins the southbound Parkway-outbound Route 2 movement.

- A uniform two-lane pavement is maintained for the northbound Parkway traffic throughout.



Preferred Alternative: Provisions for Pedestrians and Bicyclists

Figure M-G

- For the southbound Parkway traffic, a uniform two-lane pavement is maintained as far as the signalized intersection. Beyond the intersection the pavement tapers from two lane to one lane in a distance of 160 feet, where it joins the inbound Route 2 traffic.

- A single lane is provided for the southbound Parkway-outbound Route 2 movement.

- The outbound garage ramp has a two-lane pavement as far as the signalized intersection with the northbound Parkway roadway. Beyond this intersection it tapers from two lanes to one lane at the second signalized intersection 110 feet away. Beyond that intersection this movement joins the outbound Route 2 movement as described above.

D. PROVISIONS FOR PEDESTRIANS AND BICYCLES

As part of the Red Line Extension project, sidewalks are to be provided completely around the garage, connecting with the west station entry. A sidewalk will also be provided on the west side of the Garage West Roadway, with a spur around the garage entry drum connecting with the freight cut-off right-of-way extending west toward Belmont.

Two sidewalks are to be provided to the east of Alewife Brook Parkway: one at roadway level and the other at the toe of the Parkway embankment connecting with the east station entry.

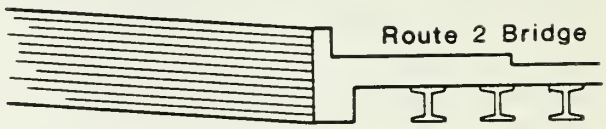
Two of these sidewalks will be affected by the interim access ramps. The sidewalk extending from the east entry to Whittemore Avenue will be relocated to the east side of the outbound ramp, and the sidewalk on the north side of the garage will be located between the outbound ramp and Yates Pond.

In addition, two new sidewalks will be added. One will extend from Route 2 to the garage entry drum ramp on the south and west side of the inbound ramp. This will serve A. D. Little employees and visitors primarily as well as the other establishments on the south side of Route 2. The second new sidewalk will be located in the right-of-way of the Lexington Branch right-of-way. It will extend from the intersection with the outbound ramp beside Yates Pond to Thorndike Street where it will connect with a pedestrianway and bike path to be provided by the Town of Arlington. This new sidewalk would serve Arlington residents primarily.

The proposed network of Pedestrianways and Bikeways is shown in Figure III-G and H. Although these sidewalks are basically designed to provide access to the station for pedestrians and cyclists, they can also function as paths through the Reservation for recreational hikers, joggers and cyclists. The network connects both Arlington and North Cambridge residential areas to the Reservation, and anticipates a later pedestrian/bikeway to the Belmont residential areas along the freight cut-off right-of-way.

POSSIBLE
CROSS-SECTION
AT PEDESTRIAN & BICYCLE PATH
ON EXISTING RAILROAD RIGHT-OF-WAY
PROVIDED BY M.D.C.

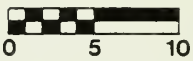
Section 6-6



Inbound Ramp

Section 7-7

CROSS-SECTION
AT PEDESTRIAN & BICYCLE PATH
ON EXISTING RAILROAD RIGHT-OF-WAY
AT ROUTE 2 BRIDGE



Cross-Sections

Figure III-H

E. PARKLANDS IMPACTED

The permanent acquisition of 3 parcels now part of the MDC Reservation will be required. These are shown in Figure III-I.

A-20 abuts Route 2 from Acorn Park Road to the Lexington Branch R-O-W and is needed for the inbound ramp. (22,000 sq. ft.)

C-20 is a small triangular piece at the intersection of the Lexington and freight cut-off rights-of-way. It is needed to permit the inbound ramp to join with the southbound lanes of the garage West Roadway. (4,438 sq. ft.)

C-21 is narrow parcel extending from the W. R. Grace property line to the rotary. It is needed for the outbound ramp. (8,420 sq. ft.)

In addition, seven temporary construction easements will be required to permit the construction of slopes or walls for the roadways, pedestrianways and bikeways, and to create compensatory flood storage areas and replacement wetlands.

A-30 and C-30 constitute the triangle occupied by Yates Pond. The A parcel (23,977 sq.ft.) is located in Arlington and the C parcel (119,562 sq.ft.) in Cambridge.

A-31 and C-31 make up a rectangular parcel adjacent to and west of the Lexington Branch R-O-W. The A parcel contains 35,000 sq.ft. and the C parcel is 94,000 sq.ft. in size.

A-32 is a long narrow parcel adjacent to the inbound ramp next to Route 2. (9,210 sq. ft.)

C-32 is a long parcel adjacent to the freight cut-off where a compensatory flood storage area and replacement wetlands will be located. This easement is 151,649 sq. ft. in size.

C-33 lies east of the Parkway and is also needed to revise the area set aside for compensatory storage for the Red Line Extension project and for the construction of the new Parkway intersection at the rotary. (158,169 sq. ft.)

The parcels in the Alewife Reservation contain no structures and are used as open space. The land is public parkland owned by the Commonwealth of Massachusetts and is in the custody of the Metropolitan District Commission. Transfer of the properties is subject to state legislation. The monetary value of these parcels has not been established.

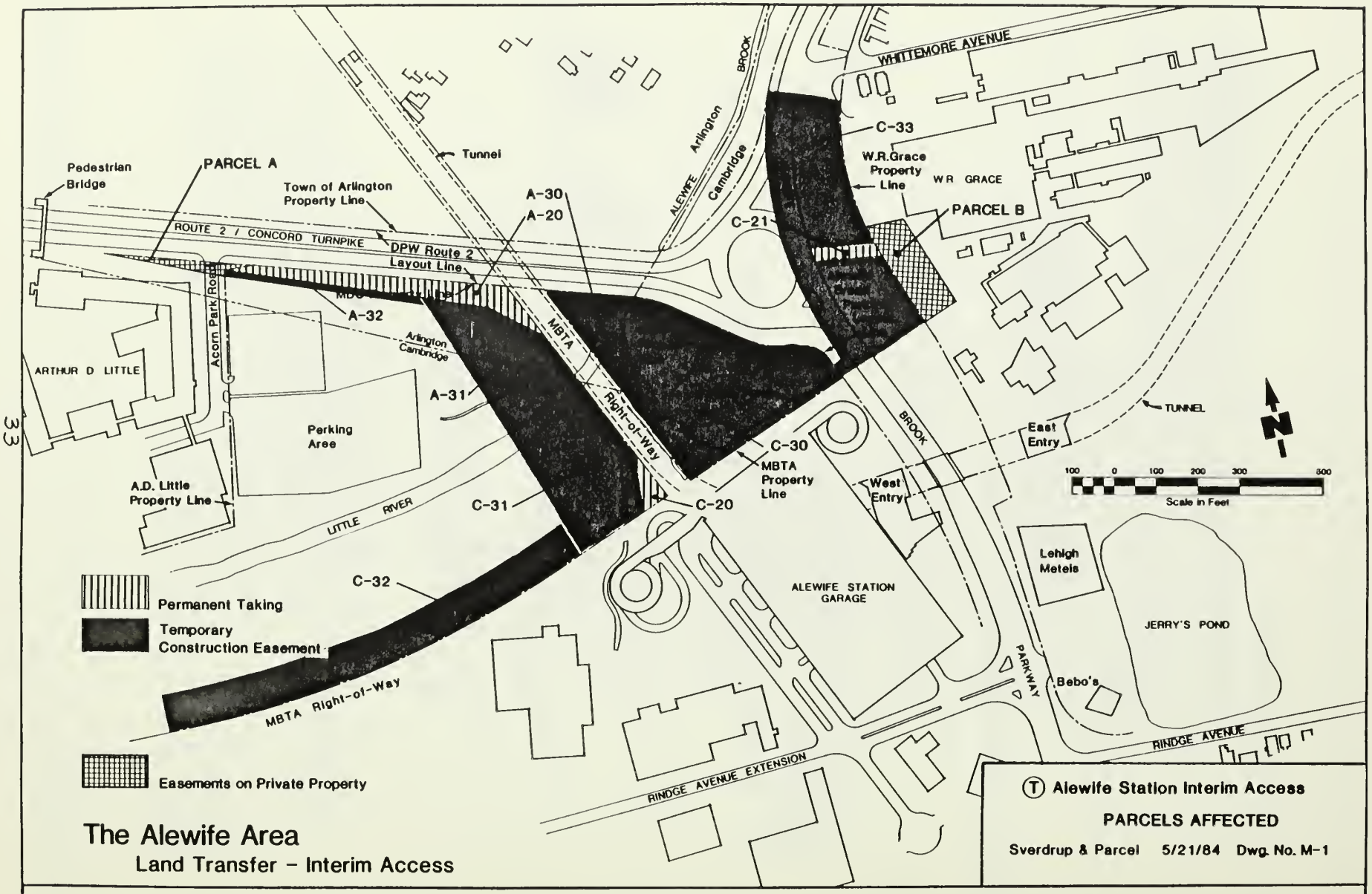

WHITTEMORE AVENUE
Arlington Cambridge BROOK
ALEWIFE BROOK
Tunnel
Pedestrian Bridge
PARCEL A
Town of Arlington Property Line
ROUTE 2 / CONCORD TURNPIKE
DPW Route 2 Layout Line
A-30
A-20
C-21
C-33
W.R.Grace Property Line
W R GRACE
PARCEL B
A-32
Acorn Park Road
Arlington Cambridge
MBTA
Right-of-Way
ARTHUR D LITTLE
A-31
Perking Aree
A.D. Little Property Line
LITTLE RIVER
C-31
C-30
MBTA Property Line
C-20
BROOK
East Entry
West Entry
TUNNEL
N
100 0 100 200 300 600
Scale in Feet
Lehigh Metels
ALEWIFE STATION GARAGE
JERRY'S POND
Bebo's
PARKWAY
RINDGE AVENUE
RINDGE AVENUE EXTENSION
C-32
MBTA Right-of-Way
Permanent Taking
Temporary Construction Easement
Easements on Private Property
The Alewife Area
Land Transfer - Interim Access
Ⓣ Alewife Station Interim Access
PARCELS AFFECTED
Sverdrup & Parcel 5/21/84 Dwg. No. M-1

Figure III-1

The Alewife Reservation (East and West) of the Metropolitan District Commission shown in Figure III-J is 124 acres in size and extends along the Little River from the Alewife Brook Parkway on the east to and including Little Pond on the west. The areas impacted by the Interim Access project are all located at the easterly extremity of the Reservation.

The eastern part of the Reservation impacted by the project has historically been dominated by transportation uses, including the Concord Turnpike, Alewife Brook Parkway and three railroad lines. The proposed inbound ramp would be located along the northern periphery of the Reservation between the Concord Turnpike (Route 2) and paved land which has been leased to Arthur D. Little for parking. The portion of the inbound ramp which crosses the Reservation in a north/south direction does not require acquisition of parkland, other than a small triangular parcel immediately adjacent to the Alewife garage drum ramp. This land is under the jurisdiction of the MBTA as a transportation right-of-way. The Red Line tail track tunnel runs beneath it and provisions have been made on the surface for possible future restoration of rail service. The interim inbound ramp has been designed to be integrated as best as possible within the Reservation. The measures to be taken to minimize the impacts of the roadway on the Reservation are described later in this report.

The outbound access roadway impacts MDC parkland on the eastern side of and immediately adjacent to the Dewey & Almy rotary. This small piece of parkland is severed off from the main Reservation area by the Alewife Brook Parkway and at present is undeveloped wetlands.

F. WETLANDS IMPACTED

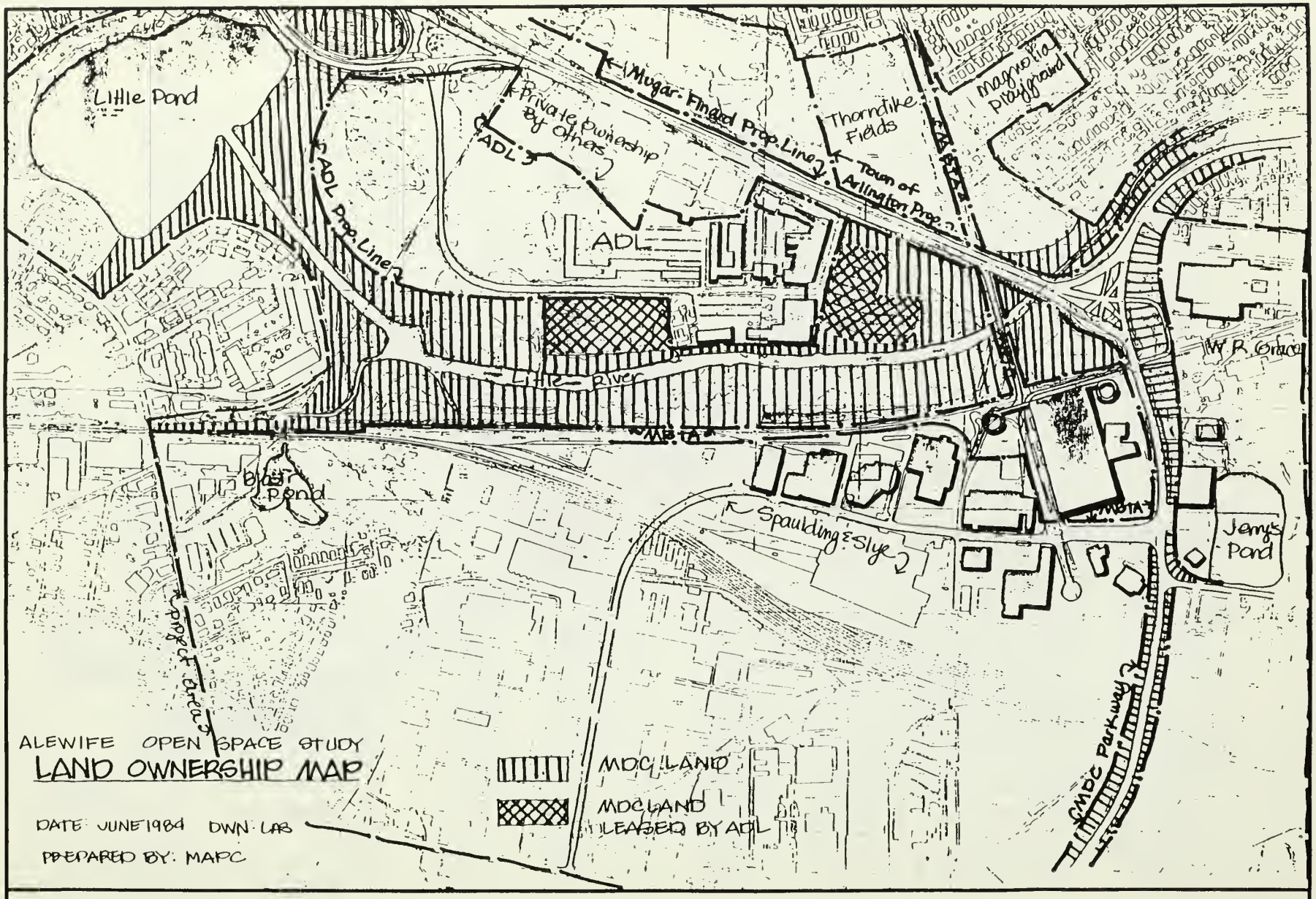
The wetlands located in the Alewife area are shown in Figure III-K. The only wetlands permanently impacted is a 3,200 sq.ft. segment of the wetlands lying between the Parkway and the W. R. Grace property. This wetlands area now contains trash and dumped waste with vegetation of limited value.

The C-32 new construction easement affects only uplands in the MDC Reservation and does not impact wetlands. Within this easement the required compensatory flood storage area and replacement wetlands will be created. The C-33 new construction easement east of Parkway does impact some wetlands.

The primary wetlands impact results from the set of temporary construction easements already granted and currently being used for the Red Line Extension project. Their restoration as wetlands is a requirement of the Superseding Orders of Condition issued by the Department of Environmental Quality Engineering. Restoration will occur at the conclusion of the Red Line and Interim Access construction.

G. FLOOD WATER DISPLACEMENT

The DEIR estimated the compensatory flood storage area requirements for Alternate 4 to be 223,000 cubic feet. A refinement in the design of the ramps enables this total requirement to be reduced. Part of the refinement is



MDC Alewife Reservation

Figure III-J

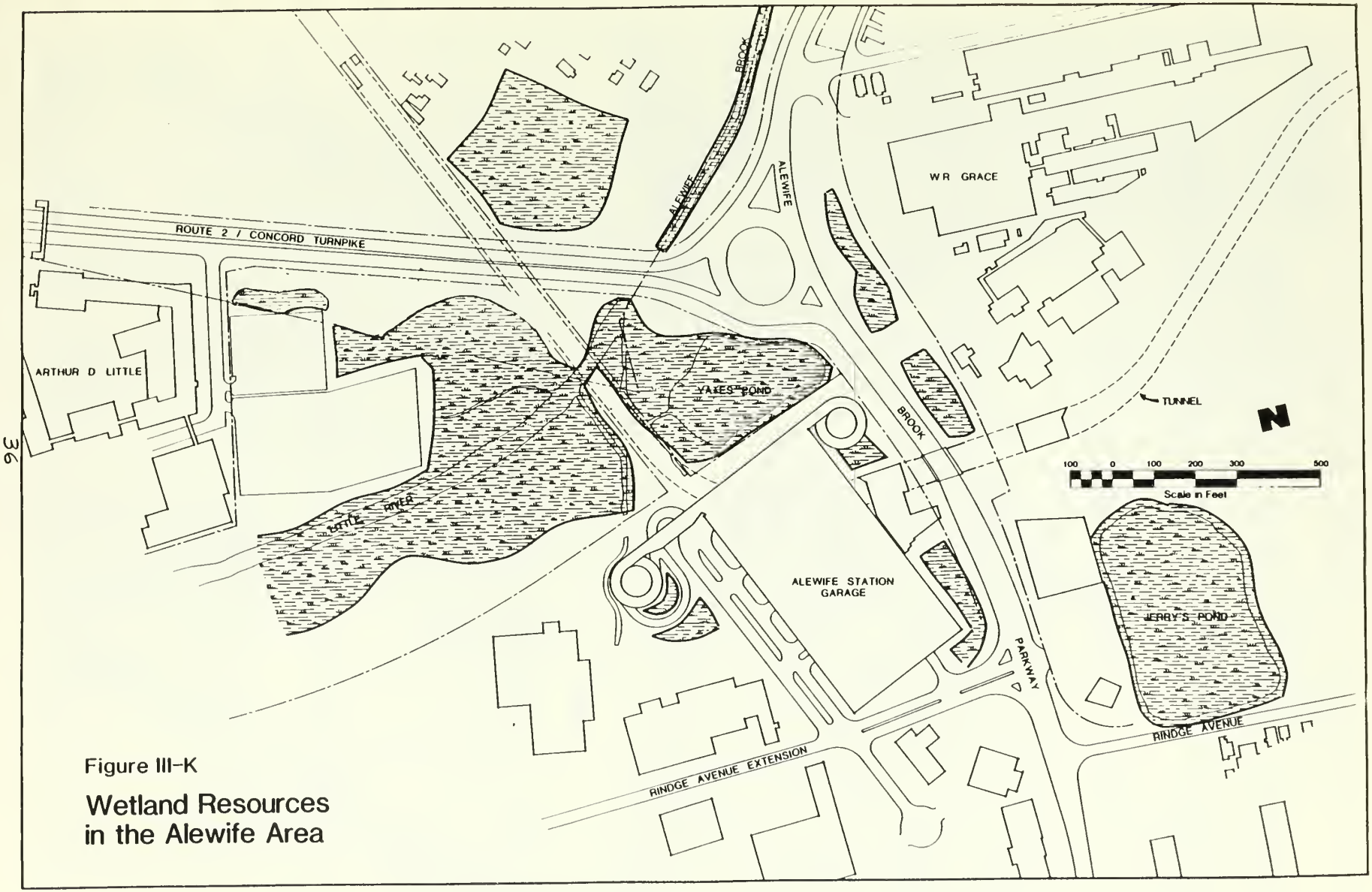


Figure III-K

Wetland Resources in the Alewife Area

the acceptance of the 50-year flood as the design standard rather than the 100-year flood. This change is proposed as a mitigating measure.

As pointed out earlier, the inbound ramp would be built at a flat grade across the Reservation at elevation 7.5 MDPW base which is consistent with the 50 year flood design control. The 100 year flood stage is shown in Figure III-L.

The new requirement for compensatory flood water storage is 183,000 cubic feet. See Appendix I for calculations.

H. OTHER HYDROLOGICAL CONSIDERATIONS

The Alewife Interim Access roadways will substitute approximately two and a half acres of impermeable bituminous concrete travel lanes and sidewalks for the existing permeable surface of the area. This displacement of the existing permeable surface will increase the amount of runoff generated because the present ability of the existing soil and any vegetation present to absorb water will be lost. The rainfall that previously filtered into the soil or was absorbed by vegetation will now flow over the new surfaces. Also, because of the use of the roadway, the quality of runoff will decrease mainly due to oil and grease from passing automobiles and salt from winter maintenance activities. The runoff from the proposed roadways will be directed to Alewife Brook and away from Yates Pond. The runoff from the inbound ramp will go directly to the Brook. The runoff from the outbound ramp will go into the Alewife Station drainage system and in turn to the Alewife Brook.

A water quality summary for Alewife Brook can be found in the Final Environmental Impact Statement - Red Line Extension: Harvard Square to Arlington Heights, U.S. DOT August 1977, p. C-3.

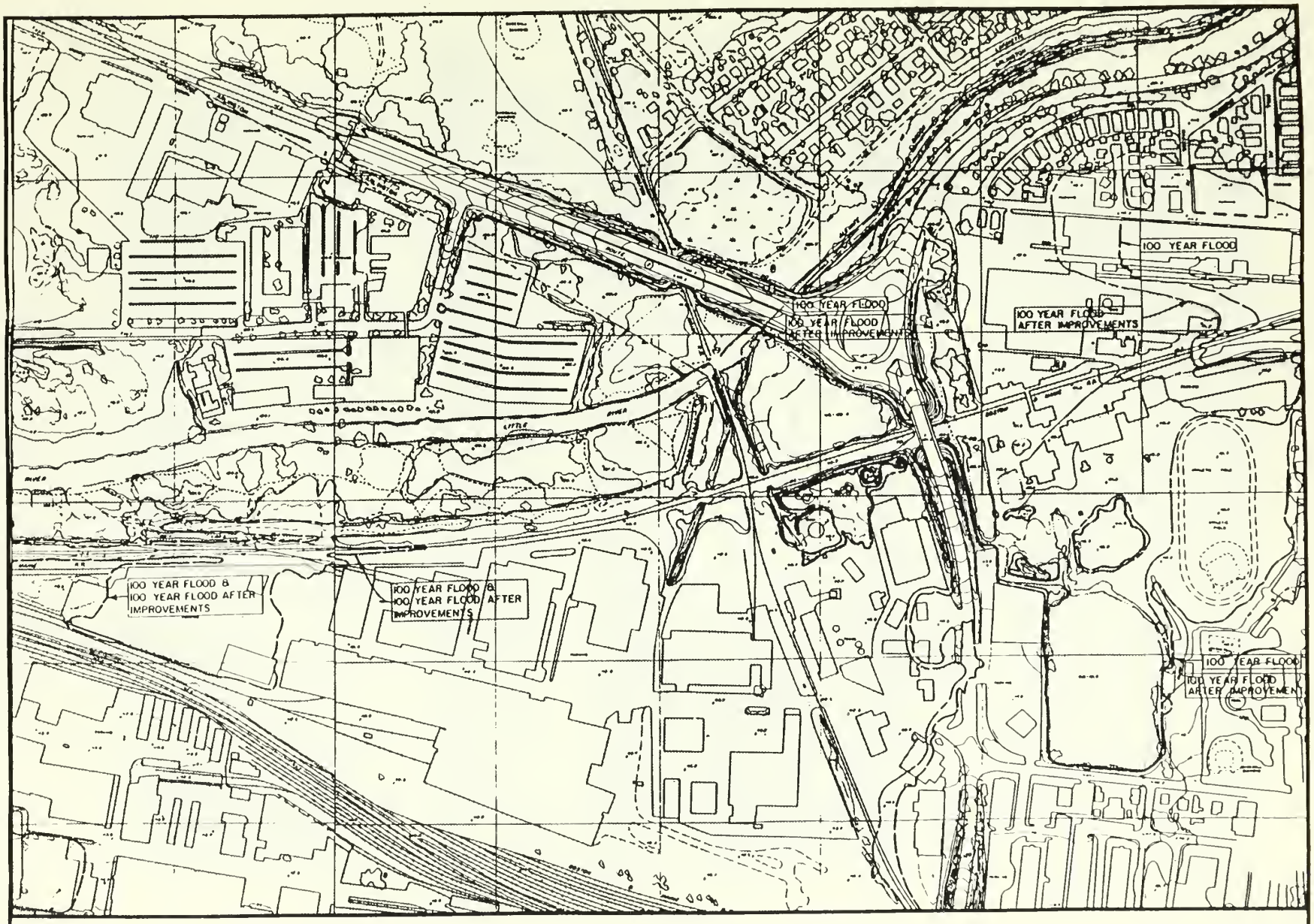
I. CONSTRUCTION STAGING

The primary difficulty in staging the construction of the Interim Access ramps is to convert the Route 2-Alewife Brook Parkway rotary into a signalized intersection at new grades while permitting all traffic movements to continue. It is proposed, in concept, that this be accomplished in six stages. The contractor will establish the construction stages subject to the approval of the MBTA, and the MDPW and MDC.

Stage 1 - Build Inbound and Outbound Ramps

The inbound and outbound ramps are built. Pavement, curbing, sidewalks and landscaping would be completed throughout except for the outbound ramp's connection with Alewife Brook Parkway, which would be temporary in nature.

Route 2 and Alewife Brook Parkway is unaffected except at their connections with the ramps.



100 Year Flood Stage (Source: Camp, Dresser, & McKee) Figure III-L

A significant feature of the immediate construction of both garage ramps is that the mitigating measures related to the adjacent wetlands and/or parklands could also be implemented at this stage.

Stage 2 - Build Temporary Route 2-Parkway Outbound Ramp Intersection

A temporary signalized intersection is built connecting the northbound Parkway and the outbound ramp with the inbound Route 2 lanes. These Route 2 lanes would be channeled into the intersection from their present alignment near the bridge over the Lexington Branch MBTA R-O-W.

Inbound Station (and Triangle development) traffic would use the inbound ramp.

Outbound Station (and Triangle) traffic would use the outbound ramp.

Inbound Route 2 traffic would use the inbound garage ramp. Southbound traffic would turn right at the Rindge Avenue Extension-Parkway intersection and northbound traffic would turn left at the inbound ramp-outbound ramp intersection.

Outbound Route 2 traffic could be subjected to a red phase at the temporary signalized intersection.

Northbound Parkway traffic could also be subjected to a red phase at the temporary intersection.

Southbound Parkway traffic would be subjected to two local detours in the vicinity of the west side of the rotary as it crosses the construction of the temporary T roadway first at one location and then at another. These local detours would occur as the temporary Route 2 connection is graded and paved.

Stage 3 - Construct North and South Segments of New Parkway Intersection

Except for the area occupied by the temporary roadway built in Stage 2 and the northbound Parkway pavement, the entire new intersection is built. In addition a temporary pavement would be built on the alignment of the north side of the rotary for use in Stage 4.

Inbound Station traffic would use the inbound ramp.

Outbound Station traffic would use the outbound ramp.

Inbound Route 2 traffic would use the inbound ramp and make the same turning movements as in Stage 2.

Outbound Route 2 traffic would turn left at the temporary intersection between the northbound Parkway and the temporary connection to Route 2. To avoid the left turn queue, particularly in the PM peak, Route 2 traffic would have the option of using the outbound ramp.

Northbound Parkway traffic would use the same roadway as in Stage 1, but the roadway would now become two-way.

Southbound Parkway traffic would share the northbound Parkway pavement with that traffic and would be subjected to a red signal phase at the temporary Route 2 intersection.

Stage 4 - Replace Temporary Route 2 Connection

The temporary Route 2 connection would be removed and the portion of the new Parkway intersection that will occupy that area would be built.

Inbound Station traffic would use the inbound ramp.

Outbound Station traffic would use the outbound ramp.

Inbound Route 2 traffic movements would remain unchanged from Stage 2 and 3, using the inbound ramp and either the Rindge Avenue Extension-Parkway intersection or the outbound ramp.

Outbound Route 2 traffic would use the temporary connection, built in Stage 3, between the Parkway northbound and the completed south-to-west leg on the signalized intersection. This traffic would enter the connection either via a left turn off the Parkway or by an oblique movement from the outbound ramp.

Northbound Parkway traffic would continue the same movement as in Stage 3.

Southbound Parkway traffic would also continue the same movement as in Stage 3, although the temporary traffic signal used to permit left turning outbound Route 2 traffic would be relocated slightly to the north from its location in Stage 3.

Stage 5 - Complete Construction of New Intersection

The northbound Parkway pavement and its connections to and from Route 2 and from the outbound garage ramp would be rebuilt at final grade and alignment. The southbound Parkway pavement would be temporarily widened to permit two-way traffic movements.

Inbound Station traffic would use the inbound ramp.

Outbound Station would use the outbound ramp and would be subjected to local detours at the Parkway intersection as it crosses through the Parkway northbound lanes reconstruction.

Inbound Route 2 traffic would continue to use the movements established in Stage 2.

Outbound Route 2 traffic would use either the final inbound Route 2 lanes from the crossing over the inbound ramp to the crossing over the Lexington R-O-W or alternatively, the outbound ramp. A temporary traffic signal would control the temporarily conflicting movement with southbound Parkway traffic.

Northbound Parkway traffic would share with the southbound Parkway traffic the pavement designed for the latter. It would be subjected to a red phase at the permanent signalized intersection which would be used by outbound ramp traffic.

Southbound Parkway traffic would be on permanent location but would share its pavement with northbound Parkway traffic. It would be subjected to a red signal phase at the oblique intersection with outbound Route 2 traffic and at the permanent intersection.

Stage 6 - New Intersection Open

All final traffic movements would be permitted. Any remaining temporary signals and pavement would be removed, final curbing installed and landscaping completed.

The proposed construction is scheduled to start in early 1985 and be completed in about 10 months.

J. TRAFFIC ANALYSIS

1. Impact of Red Line Extension

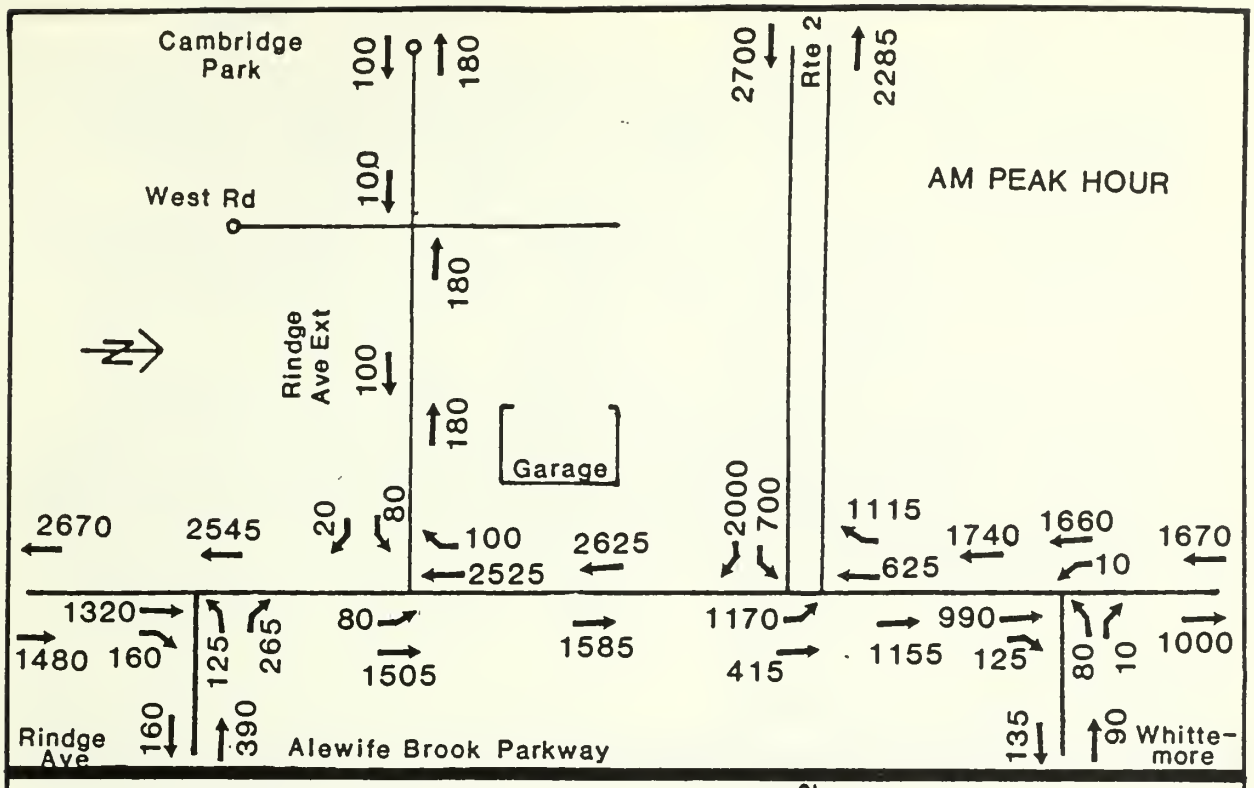
"Extension of the Red Line would reduce transit travel time from outlying communities to Cambridge and downtown Boston. The overall time reductions would benefit present transit users and make transit more competitive with the automobile, resulting in approximately 7,675 automobile trips being diverted to transit."

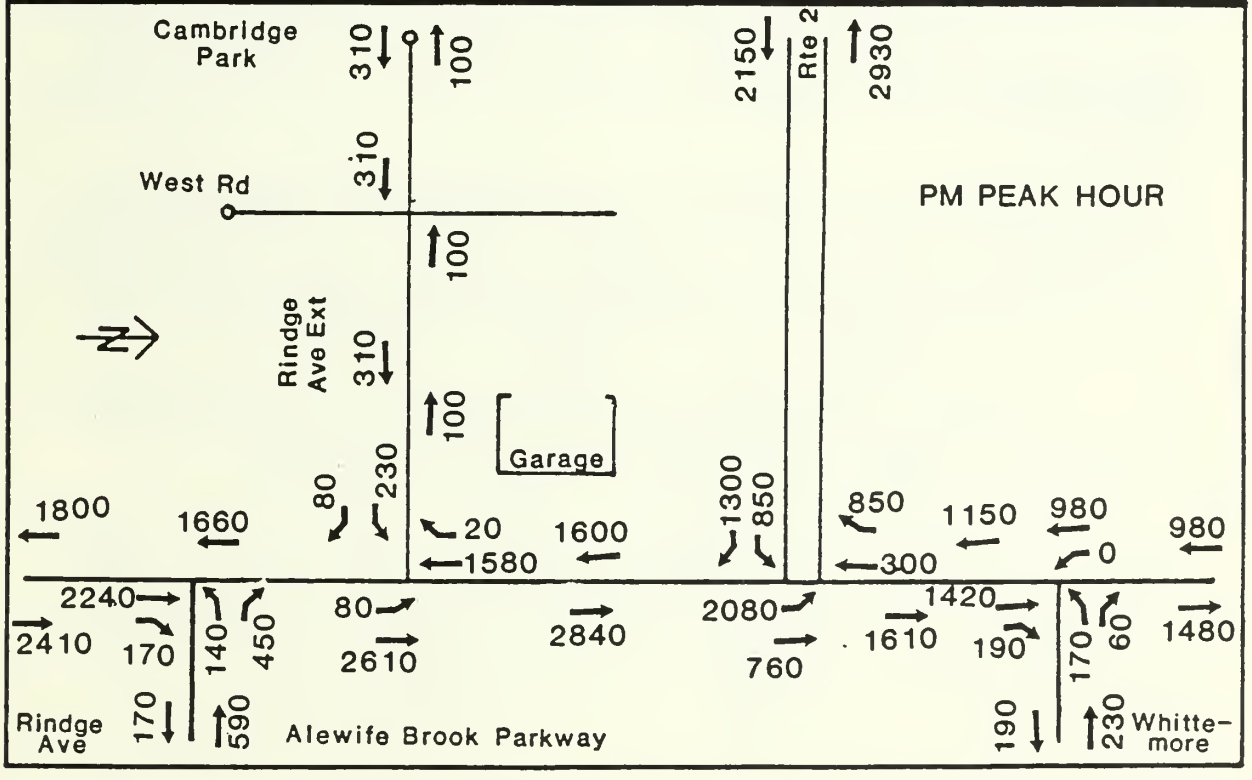
The Red Line EIS also notes that approximately 5,200 daily automobile trips would be diverted to the Alewife Station. In a general corridor context then, the Red Line Extension would reduce daily travel demand by some 5,200 generally from the Alewife area towards the regional core and by an additional 2,500 vehicles from easterly of Alewife towards the regional core.

While the transit extension is anticipated to reduce automobile traffic by some 7,700 daily vehicles, demand for travel will generally grow over time. On some major streets, traffic volumes will tend to return to pre-transit levels. However, by virtue of the diversion of motorists to transit, traffic volumes will always be less than if there were no transit extension. The roadways most likely to have traffic volume reductions due to the transit extension include Alewife Brook Parkway, Fresh Pond Parkway, Concord Avenue and Massachusetts Avenue.

2. Analysis Assumptions

The traffic analyses performed for this project includes the following assumptions: use of the 1982 existing and the 1987 projected traffic volumes from the Spaulding & Slye Cambridgepark (Triangle) FEIR No. 4512, a modified development program and modified traffic volumes to the garage. Figure III-M shows the 1982 AM and PM existing traffic volumes for the immediate area.





MBTA Alewife Station Interim Access Study	1982 EXISTING TRAFFIC VOLUMES	Figure III-M

Segal DiSarcina Associates
Transportation Consultants

The development program for the Triangle FEIR made certain assumptions of future land uses which were updated for this study. Table II-A, Proposed Development Program, provides a summary of the future development programs for the Triangle FEIR, the City of Cambridge's DEIR and this study.

Using this study's modified development program, changes in projected development traffic were calculated and were then used to modify the 1987 traffic volumes from the Triangle FEIR. A set of 1987 AM and PM peak-hour traffic volumes were thus produced with no MBTA garage traffic volumes included.

The MBTA garage contains 2000 parking spaces. Regardless of initial traffic management strategies, the effects of accepting or discharging 1000 vehicles during the peak hour for the 1987 analysis year along with 200 entering and 200 exiting kiss-ride vehicles during peak hour was tested. Thus, the total 1987 projected traffic volumes were modified to include 1,200 entering and 200 exiting garage vehicles in the AM peak hour and the reverse during the PM peak hour. Figure III-N then shows the 1987 AM and PM future traffic volumes for the immediate area.

Figure III-O shows the traffic assignments for the Preferred Alternative.

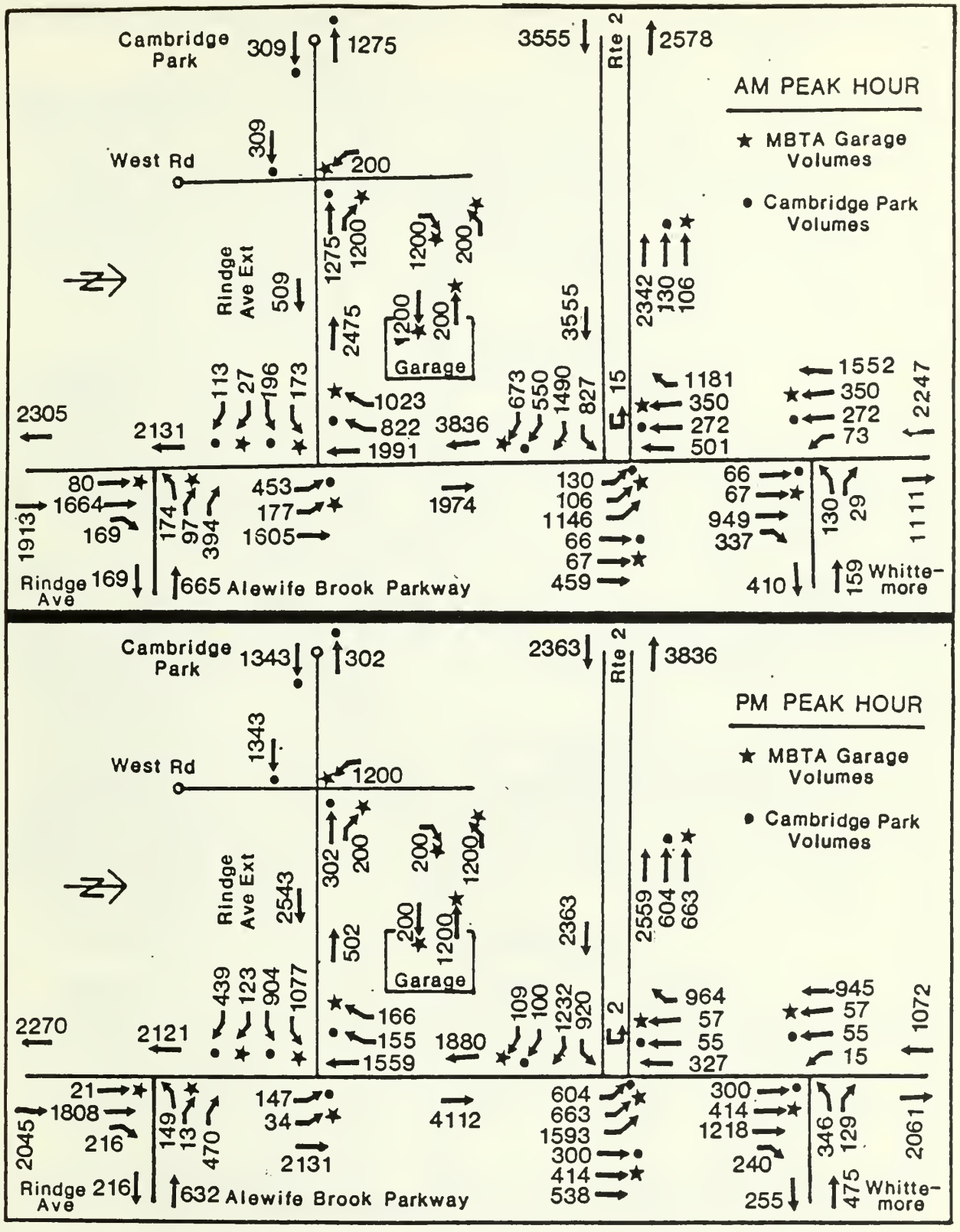
3. Preferred Alternative

The preferred alternative explicitly addresses the congestion issues at the Alewife Brook Parkway-Rindge Avenue Extension intersection. For the AM peak period in the 1987 analysis year, the unconstrained southbound morning movement on the Parkway approaching Rindge Avenue Extension is 3,836 vehicles; 1,991 of which proceed straight and 1,845 of which turn right into Rindge Avenue Extension.

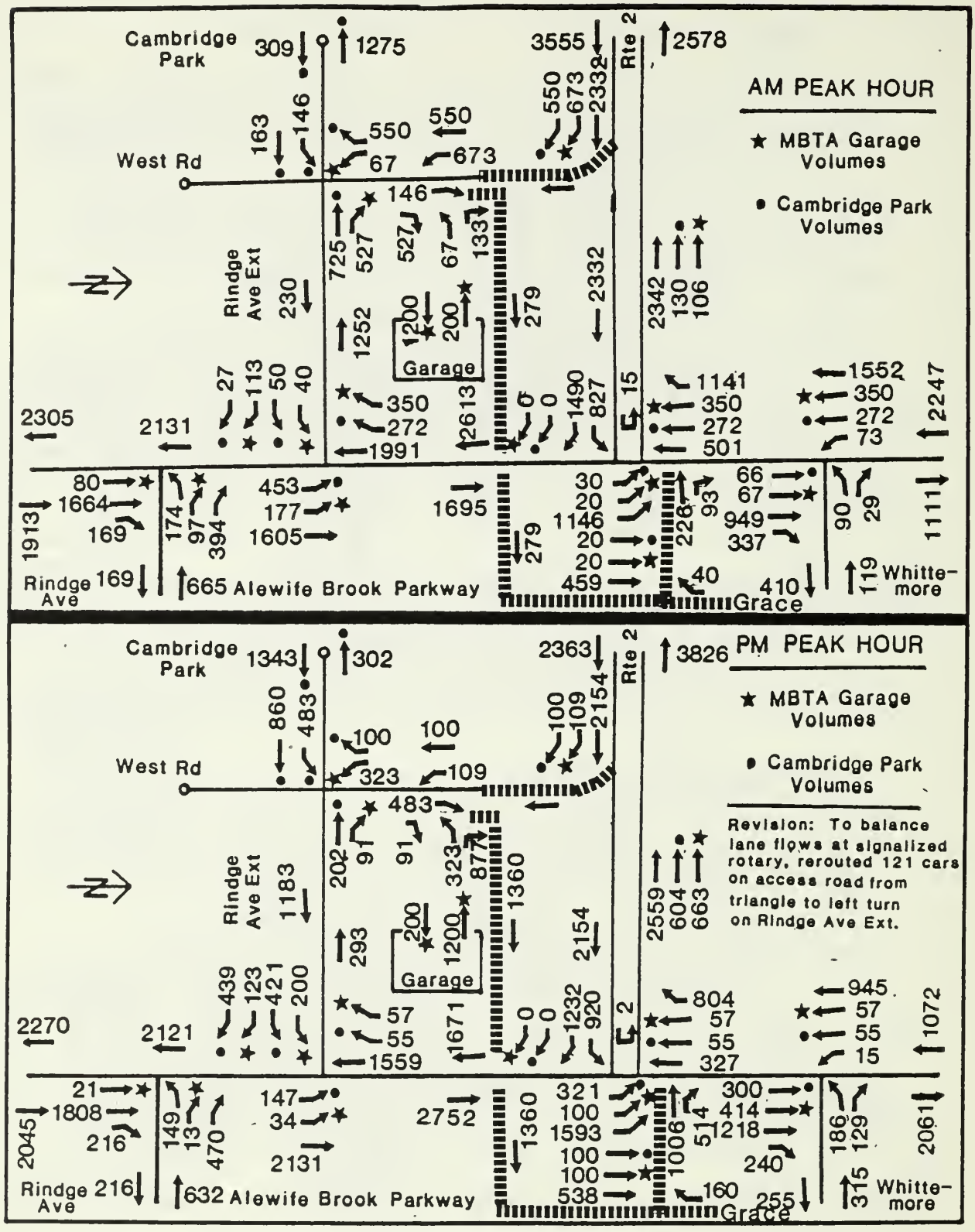
In the preferred alternative, 1,223 vehicles are removed from this intersection with the total Parkway volume reduced to 2,613 vehicles; 1,991 of which proceed straight and 622 of which turn right into Rindge Avenue Extension. In the preferred alternative, the total Parkway volume is reduced by 37 percent and the right-turn volume is reduced by 66 percent. These substantial reductions would allow for relatively unimpeded access to the MBTA station.

In addition, the preferred alternative also removes these 1,223 vehicles from the Route 2 rotary intersection, leaving some 2,332 vehicles approaching the revised rotary area intersection. This 30 percent reduction will significantly improve the ability of that intersection to function.

Operations of the inbound ramp require that the Acorn Park roadway entrance onto Route 2 be closed and all Acorn Park roadway traffic be routed onto the inbound ramp whereby it can travel towards Alewife Brook Parkway southbound via Rindge Avenue or towards Alewife Brook Parkway northbound or Route 2 westbound via the outbound ramp. These Acorn Park roadway volumes are a peak PM flow which will not interfere with the AM peak volume on the inbound access ramp.



MBTA Alewife Station Interim Access Study	1987 BUILD YEAR TRAFFIC VOLUMES ALTERNATIVE No Build with Unconstrained volumes	Figure III-N



MBTA Alewife Station Interim Access Study	1987 BUILD YEAR TRAFFIC VOLUMES with triangle volumes ALTERNATIVE 4	Figure III-O

Revised in FEIR

Vanasse Hangen Brustlin, Inc. Transportation Consultants

The traffic impacts associated wih the outbound ramp during the PM peak period are basically a mirror image of the AM operations.

In the preferred alternative, the PM outbound movement bypasses the Rindge Avenue Extension intersection, removing some 1,360 vehicles from this intersection. This reduces the v/c ratio to a 1.02 level from a No Build v/c ratio of 1.46. The Route 2 rotary is replaced with a channelized, signalized intersection with the outbound access road entering as a signalized approach. This revised intersection would have a 1.03 v/c ratio compared to a No Build v/c ratio of 1.15.

As an additional part of the analysis, the levels of service were calculated for several intersections in the surrounding area. These intersections are:

- Alewife Brook Parkway at Massachusetts Avenue
- Lake Street at Massachusetts Avenue
- Lake Street at Route 2 Ramps Westbound
- Lake Street at Route 2 Ramps Eastbound
- Cross Street at Brighton Street
- Blanchard Road at Concord Avenue
- Alewife Brook Parkway at Concord Avenue

The analyses were performed for the 1982 existing traffic volumes, for 1987 future traffic volumes (unconstrained) and for 1987 future traffic volumes (constrained). The unconstrained traffic volumes assume that transit garage volumes would divert some traffic to other routes under a No Build situation where access to the garage is constrained.

In general, the analyses shows that traffic volumes, v/c ratios and levels of service would increase from 1982 to 1987. In the situation without an interim access road, the growth would be larger because diversions to these streets and intersections would occur due to more congested operations in the vicinity of the station. When there is an interim access road alternate, the growth in traffic volumes, v/c ratios and levels of service would not be as large due to the ability of the interim access road to relieve traffic operations in the vicinity of the station.

K. SUPPLEMENTARY TRANSPORTATION SYSTEMS MANAGEMENT ACTIONS

A basic purpose of the extension of the Red Line to Alewife is to reduce automobile commuting to and congestion in the regional core. Most automobile commuting occurs during the peak hours. Therefore a fundamental objective in the use of the Alewife Garage is to get as many cars as possible off the streets and into the garage during the AM peak period. To encourage transit use, access and egress to the station should be as free flowing as possible.

A second major objective of the MBTA is to maximize transit ridership. More riders are obtained from high-occupancy vehicles (HOVs) than low-occupancy vehicles (LOVs). If the garage proves so successful that it is filled early in

the AM peak period then, if they can be proven to be cost-effective, steps could be taken to:

- o Give priority to high-occupancy vehicles
- o Encourage occupants of low-occupancy vehicles to join others in high-occupancy vehicles

A third objective of the MBTA is to derive as high a proportion of its income from revenues as possible, consistent with its broader needs to conform to public policies. Pricing strategies for the garage therefore become an important element. High prices would reduce demand; low prices would increase demand. The relationship between garage revenues, transit ridership revenues, number of cars (and occupants) diverted from the highways and transit ridership need to be constantly assessed.

Garage Opening Strategy - Experience with other new garages has shown that it will probably take some months for the garage traffic to build up to capacity. During that time the MBTA could monitor the garage activity to build up base information about auto-occupancy rates, percent of spaces occupied by incremental 15 minute periods, and the like. One or more surveys of all boarding transit riders and/or occupants of vehicles entering the garage would be useful in developing this data base concerning activity under uncontrolled circumstances.

Controlling Use of Garage by Time of Day - This technique has been discussed by the ATAC and by others as a means to reduce peak hour congestion. Suggestions have been made that if, say, only 1,000 spaces were permitted to be used during the AM peak period, the number of right turns from Alewife Brook Parkway into Rindge Avenue Extension could be cut in half during the AM peak, because the second 1,000 drivers would soon learn that garage space is not available to them. However, the result would be that this second 1,000 would remain part of the through traffic passing through the Rindge Avenue intersection or using by-pass streets through Belmont. Alternatively, if they are determined to take some advantage of the accessibility of the Alewife station, they would drop-off passengers there and continue on their journey to work. Drivers would then be making turning movements at the Rindge Avenue Extension-Alewife Brook Parkway twice during the AM peak.

Use of this technique would thus be counter productive and inconsistent with the MBTA's objectives of removing AM peak hour traffic from the streets and maximizing transit ridership. The MBTA should encourage the full use of the 2,000 spaces in the garage as early as possible after opening, and should encourage AM peak hour drivers to use it.

Then, as the garage approaches capacity, other selected TSM techniques could be imposed.

HOV Garage Priority - As the garage approaches capacity, a proportion of the spaces could be reserved for use by HOVs exclusively, or LOVs could be charged a higher per vehicle fee. Each technique could be tried, but not in combination, to ascertain their effectiveness. The ratio of spaces allocated or the differential in fees would be largely a matter of trial and error, but it should be kept in mind that the objectives of the tests are to increase

ridership, to keep the garage fully occupied, and to increase revenues to at least cover policing and other costs associated with administering such a program.

Encouraging LOV Occupants to Join HOV Pools - This is not an objective easily achieved because of the wide variations in individuals' time demands, schedule irregularities, travel patterns and life styles. This technique would make greater use of existing Caravan, Inc. resources. It would expand current EOTC and MBTA efforts to:

- Work through large Boston and Cambridge employers to reach employees either driving to work or using MBTA garages and explore ways in which they might be induced to begin their HOV journey closer to home. Of course, the most feasible HOV mode in some instances might be one which would use the bus terminal rather than the garage.

- Work through local community groups to organize carpools or vanpools through neighborhood associations, churches, or local transportation committees.

Again, this program involves continuing additional administrative costs which must be taken into account when evaluating program effectiveness.

Bus Service - As indicated above, exploration of techniques for increasing the ratio of HOVs may reveal that bus service may be found more attractive for some than carpools or vanpools if the bus service could be tailored to meet their needs.

The Lexington Transportation Advisory Committee has already approached the MBTA about the possibility of running a Lexpress route to Alewife.

The current Northwest Corridor MBTA bus study recognizes that the bus network needs to be designed to meet the needs of all potential riders, not just those destined for The Red Line. For example, many northwest corridor residents whose destination is the Harvard Square area may prefer, for both cost and convenience reasons, to take a single vehicle bus ride from their home neighborhood direct to Harvard Square without the extra transfer and extra fare at Alewife. With many present bus system riders continuing to use a direct to Harvard Square route, new, less crowded service to Alewife should attract additional riders over those now using buses.

Subway Service - Equipment or track failures, signal and communications breakdowns, and delays caused by other circumstances have produced a deterioration in service, and perhaps more importantly, in peoples perception of the Red Line as a dependable line. Several current actions of the MBTA are designed to assure increased total system dependability. These include, among other things, the rebuilding of the existing fleet, the ordering of 54 new cars, the lengthening of all platforms to permit six-car operation, and the upgrading the power distribution system.

Satellite Parking - In the Boston metropolitan area, with its one vehicle ride to downtown by commuter rail, express bus or rapid transit being available in so many corridors, the concept of satellite parking requiring a bus

shuttle faces competition as an acceptable travel mode. Nevertheless, the MBTA has an active parking program which includes the creation of satellite facilities. Two locations currently being examined are the St. Camillus church parking lot on Route 2 and the former Arlington Heights bus yard on Massachusetts Avenue.

Locations which would be served by express bus to Boston or Cambridge and by shuttle buses or vanpools to suburban industrial complexes as well as by a shuttle to Alewife, would probably prove most popular.

Alewife Employers Actions

To this point, the TSM discussion has been limited to: a) taking peak-hour through traffic off the highway and putting it into the Alewife garage, b) when competition for garage space intensifies, giving priority to higher-occupancy vehicles, and c) having people start their mass transit journey further out.

The Alewife station and garage are at the apex of an area of intense development activity. By 1987, assuming the full development projections, the Alewife station and garage will be generating only 25 percent of the total peak-hour street traffic generated by activities in the Alewife area.

Although the possible actions are beyond the jurisdiction of the State, the State recognizes that to permit the whole Alewife area to function, a transportation systems management program should also seek ways of limiting and managing development traffic in a manner consistent with the local and regional objectives of encouraging jobs and tax-paying land uses. The State would, therefore, continue to cooperate with employers and their employees concerning the following actions:

Transit Ridership - Employees should be encouraged to use transit to and from work. Job opportunities should be advertised in the newspapers of communities served by transit lines routed to Alewife. Passholders could receive bonuses or benefits of some nature from their employers, such as employers participating in the costs of employee passes. The MBTA is constantly working with employers to encourage transit and pass use.

Carpools and Vanpools - Alewife area employees should be encouraged to avail themselves of services provided by Caravan, Inc.

Shuttle Bus, Shared Taxi, Subscription Bus - With the Alewife Terminal in place, the applicability of these modes would be less than for areas not as well served by transit. Nevertheless, employers should be encouraged to identify situations in which they may prove to be applicable, such as the A. D. Little shuttle to Belmont Center.

Parking Controls - Each business in the area could probably benefit from some procedures for controlling parking in the areas assigned to them. Certainly carpools and vanpools should be assured of spaces, as should flex-time workers who arrive after the morning peak. Businesses have had long experience in developing and maintaining parking controls, and Alewife businesses should be encouraged to use the most effective applicable techniques.

Flexible Work Schedules - Coordinating efforts among the various businesses in the area to develop flexible work schedules appropriate to their own needs should be encouraged. The MBTA has information on and promotes the use of flexible work schedules.

Reduced Parking Demand - Community policy, through zoning, already assumes the area will be occupied by businesses with lower than average parking demand. Whether this level of demand can be reduced further by offering rental, tax or other incentives, needs further analysis by building owner and manager and community representatives.

Conclusions

An imposing set of Transportation Systems Management measures are already being applied at the Alewife area. These include the Red Line, the feeder bus system, the reduction in number of travel lanes available to traffic moving from Route 2 to Alewife Brook Parkway, and the stringent parking controls imposed by the City of Cambridge.

The maximum utilization of the garage is essential as a support of these TSM measures and as an additional measure that would be effective in reducing overall vehicle miles traveled. Providing a direct means of access to and egress from the station and garage for buses, park-ride and kiss-ride vehicles which avoid the major traffic bottleneck intersections, and the redesign of such intersections to improve traffic flow are in themselves significant TSM techniques.

To supplement the full use of the garage, additional TSM measures are available as described in this section. Their increased use in the Alewife area could be beneficial as a brake on increasing traffic volumes.

Within the MBTA garage, if vehicle occupancy controls are introduced, they should be used to increase transit ridership, not reduce traffic volumes. The full use of the Alewife garage by transit users is an important element in the overall Transportation Systems Management program for the Boston metropolitan area.

L. OTHER IMPACTS

1. Land Acquisition

In addition to Parkland acquisitions as described in Section III-E., the proposed project requires negotiation of easements over two parcels of property which are privately owned. The shape and location of these parcels are as indicated in Figure III-I. Neither parcel contains structures and no displacment will result from the easements. The value of these two parcels has not yet been determined.

Parcel A which is 10,000± square feet in area, abuts the Concord Turnpike (Route 2) to the immediate west of Acorn Park Road and is required for the inbound ramp. The property which is owned by Arthur D. Little, Inc. is landscaped frontage to an office building.

Parcel B which is 30,000± square feet in area is the parcel which links the outbound ramp from the MBTA's Fitchburg Freight Cut-off to the ramp approach to the Concord Turnpike-Alewife Brook Parkway intersection at the MDC Right-of-Way. A portion of the property, which is owned by W. R. Grace, is presently used for Red Line construction. The remainder is unused. Commercial development is proposed for the unaffected portion of the W. R. Grace site. An easement would be negotiated for this parcel.

2. Land Use and Zoning

The land in the alignment of the Interim Access Roads is not occupied by buildings as indicated in the previous section. The Arthur D. Little site is used for research and development/general office, the Alewife Brook Reservation is Open Space, the transportation right-of-way is classified as Government Institutional, the W. R. Grace property has been used for industrial purposes but is now proposed for office and hotel use, and the Metropolitan District Commission property is classified as Open Space.

Land use in the vicinity of the proposed project is changing as can be seen by comparing Figure III-P a 1975 land-use map and Figure III-Q is a 1984 land-use map.

The proposed project is consistant with land use in the area as evidenced by the support of the Cambridge Community Development Department (Section V-H).

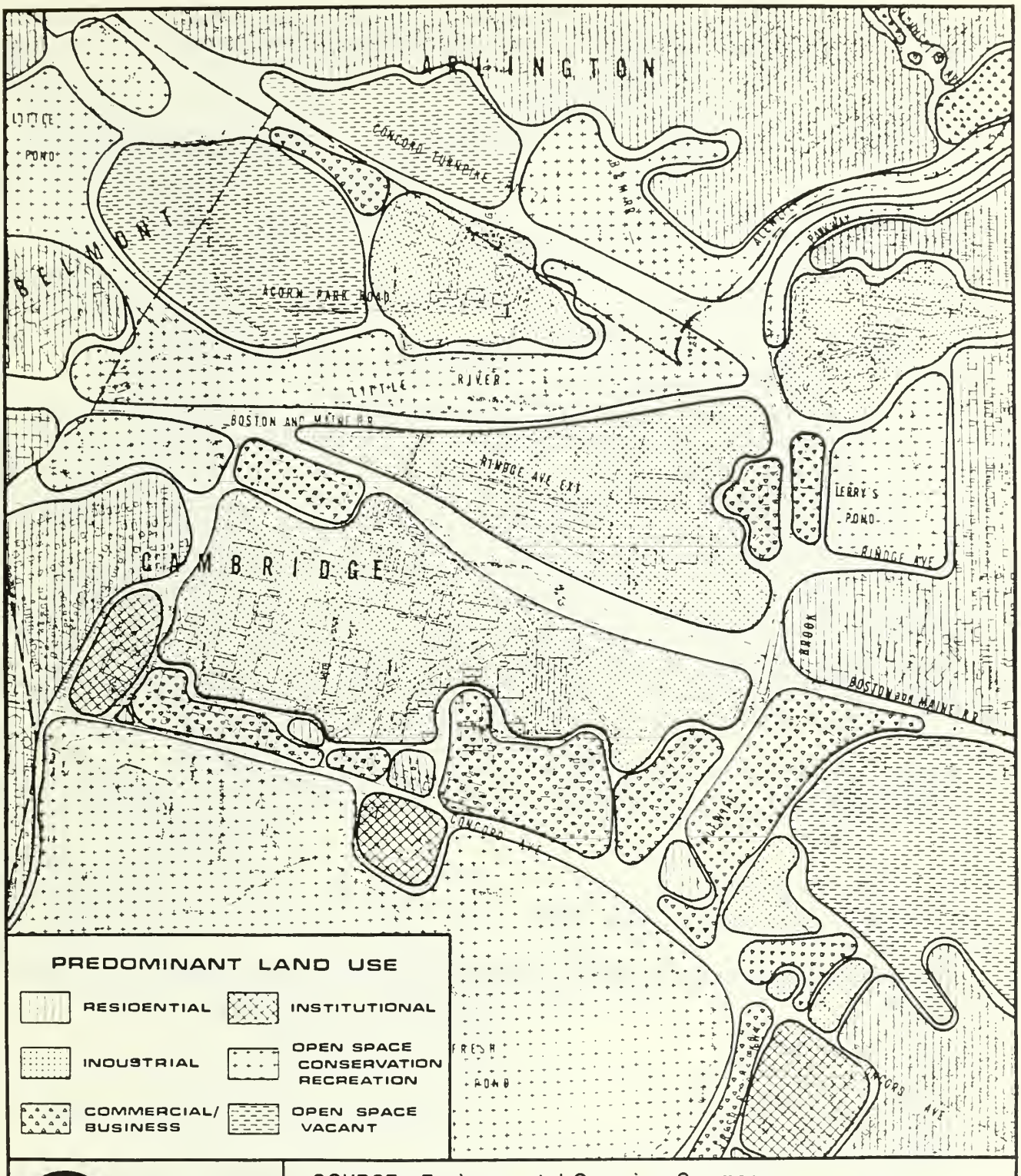
In accordance with state legislation, the MBTA does not fall under the jurisdiction of local zoning. As such the proposed project requires no change to local zoning laws.

3. Noise

The proposed project will result in noise from traffic diverted to the inbound and outbound ramps from Route 2 between Acorn Park Road on the Concord Tunrpike to Rindge Avenue on Alewife Brook Parkway.

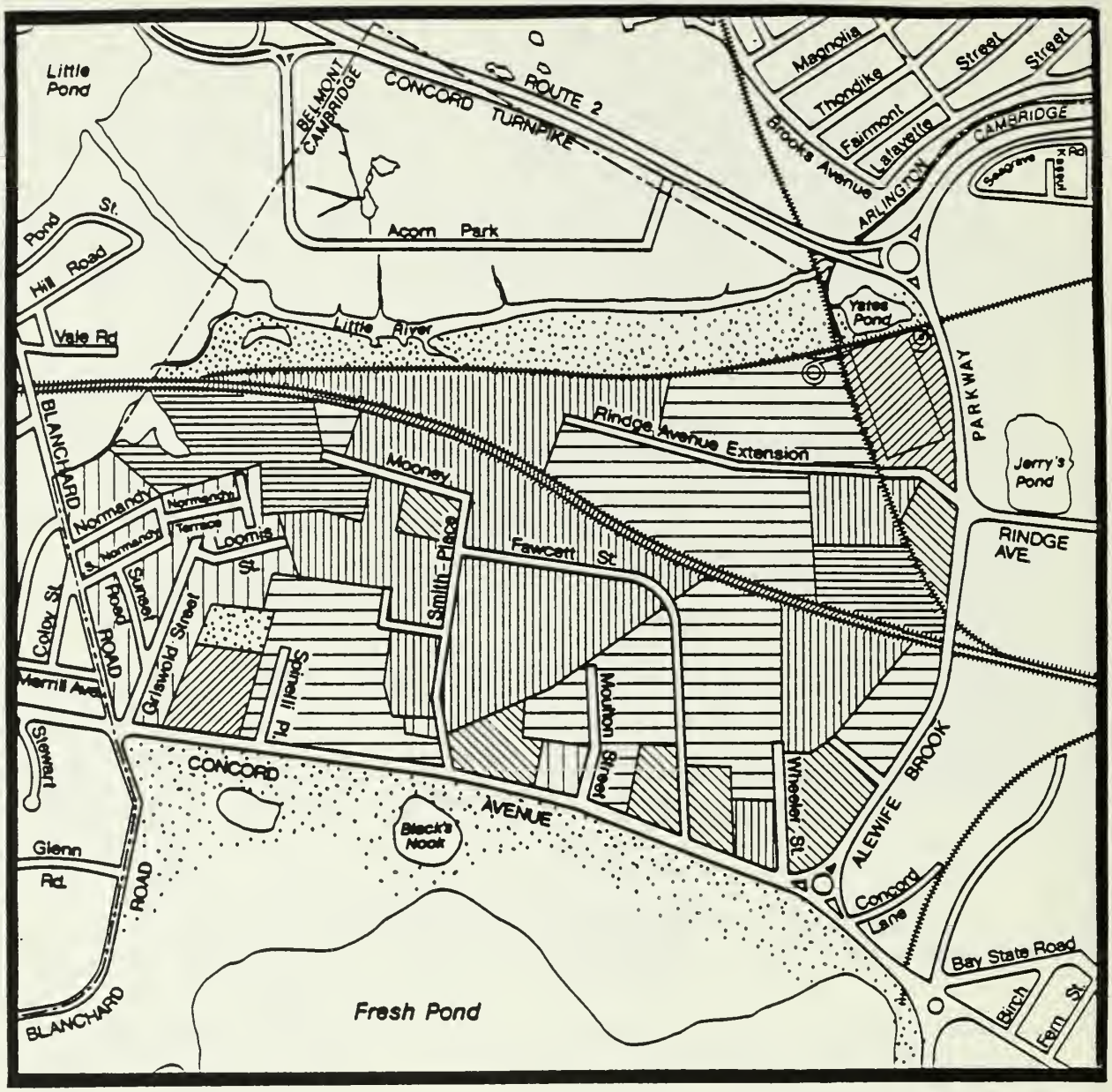
The diversions will result in a reduction of traffic on this segment of Route 2 and, consequently, a reduction in noise levels on this segment of roadway.

The nearest sensitive noise receptors in the vicinity of the outbound ramp on the east of Alewife Brook Parkway are residences on Whittemore Avenue. These residences are closer to Alewife Brook Parkway than they are to the proposed ramp. The new ramps are less than one third the distance from the existing roadways and the potential noise receptor. By virtue of the distance between the ramp and Whittemore Avenue and the existence of a roadway with higher traffic volumes nearer to Whittemore Avenue residences, the noise impact of the proposed ramp should not be significant.



SOURCE: Environmental Overview Summary
Transportation Improvements in the Alewife Area,
By FS&T, Inc. for The MDPW, 1975

Existing (1975) Land Use Figure III-P



LEGEND

- OPEN SPACE
- RESIDENTIAL
- RETAIL/SERVICE
- INSTITUTIONAL/GOVERNMENTAL
- INDUSTRY, WAREHOUSE/ WHOLESALE
- RESEARCH & DEVELOPMENT/ GENERAL OFFICE
- VACANT

ALEWIFE LOCAL ROADWAY IMPROVEMENTS

EXISTING LAND USE

0 800 1600

SCALE IN FEET approx.

SOURCE: Alewife Local Roadway Improvements
By Edwards and Kelcey, Inc for The City of Cambridge 1984

Figure III-Q

On the west side of Alewife Brook Parkway the inbound ramp parallels the Concord Tunrpike then crosses the Alewife Brook Reservation. The outbound ramp parallels the border of the Reservation between the inbound ramp and Alewife Brook Parkway. The Reservation by virtue of its lowland nature is little used by humans and as such is not a sensitive noise receptor. There are no known sensitive noise receptors in the vicinity of this roadway. The proposed ramps on the west side of Alewife Brook Parkway should have no significant noise impacts. There may be some increase in ambient noise levels within the Reservation due to the introuduction of automobile traffic through the area on the inbound ramp. The noise impact would not effect the most sensitive areas of the Reservation.

4. Navigable Waterways and Coastal Zones

The project does not impact navigable waterways or coastal zones although Alewife Brook is used for canoeing. A railroad bridge has existed on the site for many years and the ramp bridge required by the project will provide the same clearance to accommodate canoeists.

5. Endangered Species

Based on the U.S. Department of Interior's Threatened Wildlife in the United States, no threatened wildlife species exist in any part of the Alewife area.

A more detailed discussion of Alewife area wildlife can be found on pps. VI-95, 96 of the Final Environmental Impact Statement - Red Line Extension: Harvard Square to Arlington Heights, U.S. DOT, August 1977.

6. Energy Requirements and Potential for Conservation

The proposed project will impact energy consumption both during and after construction. Energy will be consumed during construction as required for the fabrication and transporting of construction materials and the operation of construction equipment.

Upon completion of construction, the project will impact energy consumed by buses and cars. Diverting traffic from the congested Route 2 to the Interim Access roads willl reduce traffic congestion and associated engine idling and stop and go traffic, thereby reducing associated fuel consumption. The Interim Access roads will also improve access to Alewife Station and increase the use of mass transportation and reduce auto use thereby further contributing to reductions in energy consumption.

7. Historic Properties

There are no known historic properties in the project area.

8. Community Disruption

The proposed project consists of an inbound and outbound roadway and the replacement of a rotary by a signalized intersection. The inbound roadway parallels an existing roadway, then traverses a railroad right-of-way which is

bounded on either side by open space. The outbound road is bounded on one side by the Alewife Station Parking Garage and the other by open space while following the alignment of a former railroad right-of-way. The outbound road then turns, paralleling an existing road and turns again rising to the grade of an existing road. The proposed roadways do not divide or disrupt local communities and, as such create no significant community disruption.

There may be some detouring of traffic onto streets in Belmont, Arlington and Cambridge during the reconstruction of the rotary. The contractor will be required to maintain present roadway capacities in terms of number of travel lanes. All efforts will be made to minimize disruption of through traffic. Any community disruption due to detouring traffic will be short term.

IV MEASURES TO MITIGATE IMPACTS

A. ADJUSTMENT IN DESIGN STANDARDS

The DEIR proposed that the inbound ramp across the Reservation and the outbound ramp adjacent to Yates Pond be built at a grade above the level of a 100-year storm. The FEIR proposes an adjustment in design standards in order to mitigate impacts. This adjustment is to place the two roads at the 50-year storm level. This is justified because:

- o The roadway for the most part is bituminous surfacing on grassed embankments. Innundation during a flood condition would result in little if any physical damage to the facility.

- o The facility is a temporary one, to be replaced by permanent facility as quickly as possible. The risks of witnessing a 100-year flood during the short useful life of the interim facility is therefore relatively small.

Environmental benefits resulting from this adjustment include:

- o Lowering the roadway below the flood elevation of the 100-year storm reduces the area disturbed by construction beyond the actual limits of the roadway surface in sensitive bordering areas. Lower, and therefore narrower, embankments will be required.

- o Lowering the roadway below the flood elevation of the 100-year storm reduces the need for compensating flood storage capability in the area.

- o Lowering the roadway below the flood elevation of the 100-year storm reduces the difference in grade between roadway and the surrounding area. Therefore, the facility will be less visually intrusive to the area.

B. REPLACEMENT OF PARKLANDS

A transfer of 34,858 square feet of MDC Reservation land to the MDPW for transportation purposes is required by the Interim Access project.

The MBTA's Fitchburg Freight Cut-off rail line right-of-way, containing about 6.5 acres, forms the southern boundary of the Alewife Brook Reservation. Of this, approximately 3.7 acres must continue to be held by the MBTA to preserve a transportation right-of-way. The MBTA commits to transfer to the MDC, the remaining land, a variable width parcel of about 122,000± square feet to compensate for the 35,000± square feet of existing Reservation land required for the project. This land is shown in Figure IV-A. Other measures to mitigate impacts are shown in Figures IV-B and IV-C.

Pedestrianways and bikeways are to be provided as part of the Interim Access project for the residents of adjacent Cambridge and Arlington neighborhood. The MBTA land would provide the MDC with a corridor between the Reservation and Belmont streets on which the pedestrian/bikeway link to Belmont could be completed by the MDC in the future.

C. REPLACEMENT OF WETLANDS

A major reason for the design and subsequent selection of the preferred alternative was its minimal impact on wetlands, only 3,200 square feet.

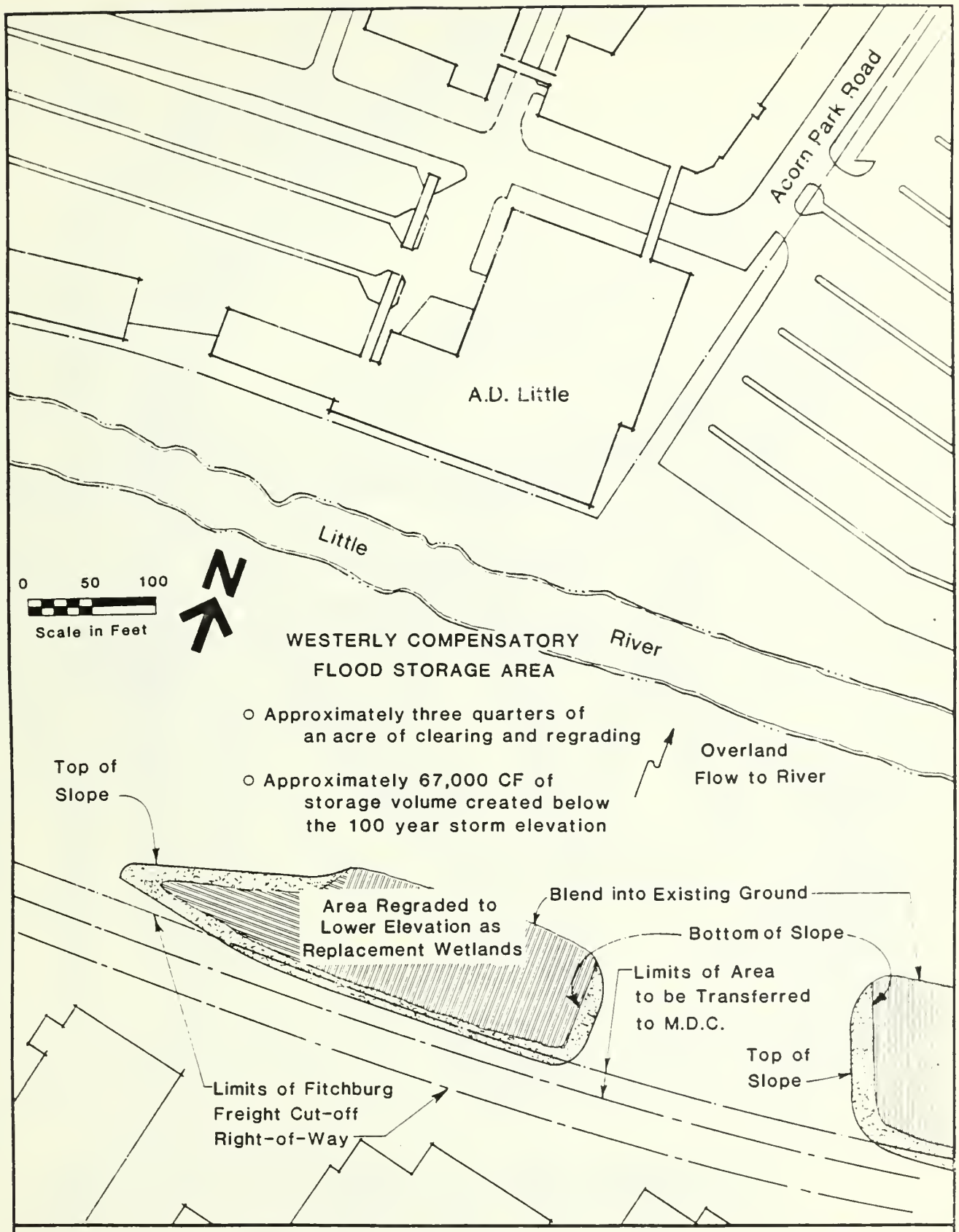
It is proposed that uplands within the Reservations adjacent to the freight cut-off be used to replace the 3200 square feet of wetlands displaced by the project as well as for the creation of a compensatory storage area. Grading and landscaping would be done consistent with the needs for a pedestrianway/bikeway to Belmont and with other uses of the Reservation as may be deemed appropriate by the MDC. A preliminary proposed treatment of the area identifying the replacement wetlands is shown in Figures IV-A and IV-B.

These uplands include part of the old railroad embankment and a long, low ridge north of it. The ridge appears to be man-made, being composed of a heterogeneous mixture of silt/clay and organic peat or muck. It was probably dumped there when the freight cut-off line and adjacent sewer excavations were mucked out. Despite its probable origin, the ridge in part has become attractively vegetated with Staghorn Sumac, Blackberries, grasses, sedges and herbaceous plants. Other parts are relatively unvegetated and disrupted by trail bike use.

It is proposed that the ridge be removed selectively, leaving some of the more handsome Sumac stands and taking care not to disturb the existing vegetation in the ditch between the ridge and the railroad embankment where there are some existing Arrowwood Viburnums, Red Stem Dogwood, Alder, and other species. It is also proposed that part of the railroad embankment would be removed, leaving sufficient width for a berm, railroad R-O-W of sufficient width for a single track, pedestrian/bike path and buffer plantings. The excavated areas would be seeded with indigenous seed mixes and replanted with native species. In part, this may be done by stripping the top 6 inch layer of soil on the ridge and respreading it after excavation and grading have been done. Many roots of the existing herbaceous materials and grasses and seeds will thus regenerate themselves, and provide cover and food for wildlife of the area.

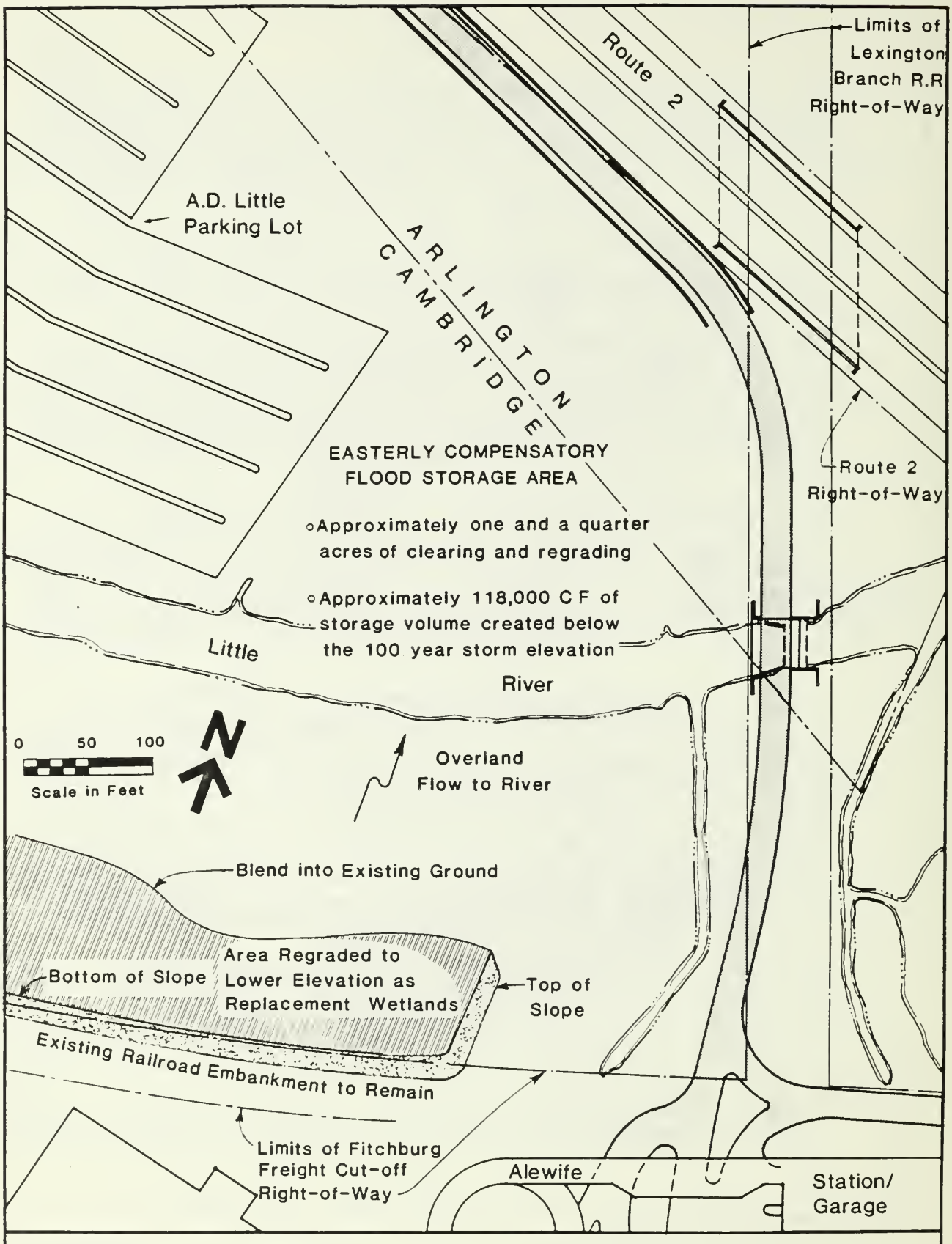
In providing for wetlands and flood storage, there is an opportunity for recreating a landscape that is as attractive or more attractive than what exists. Finished grading can be molded and blended into the surrounding terrain and native plant species not presently existing there can be introduced to attract more varied wildlife. Also, clean-up of existing trash, old tires and debris would be accomplished.

This area represents one of the temporary construction easements requested, and while regrading is occurring, this parkland area would be subjected to temporary disruption.



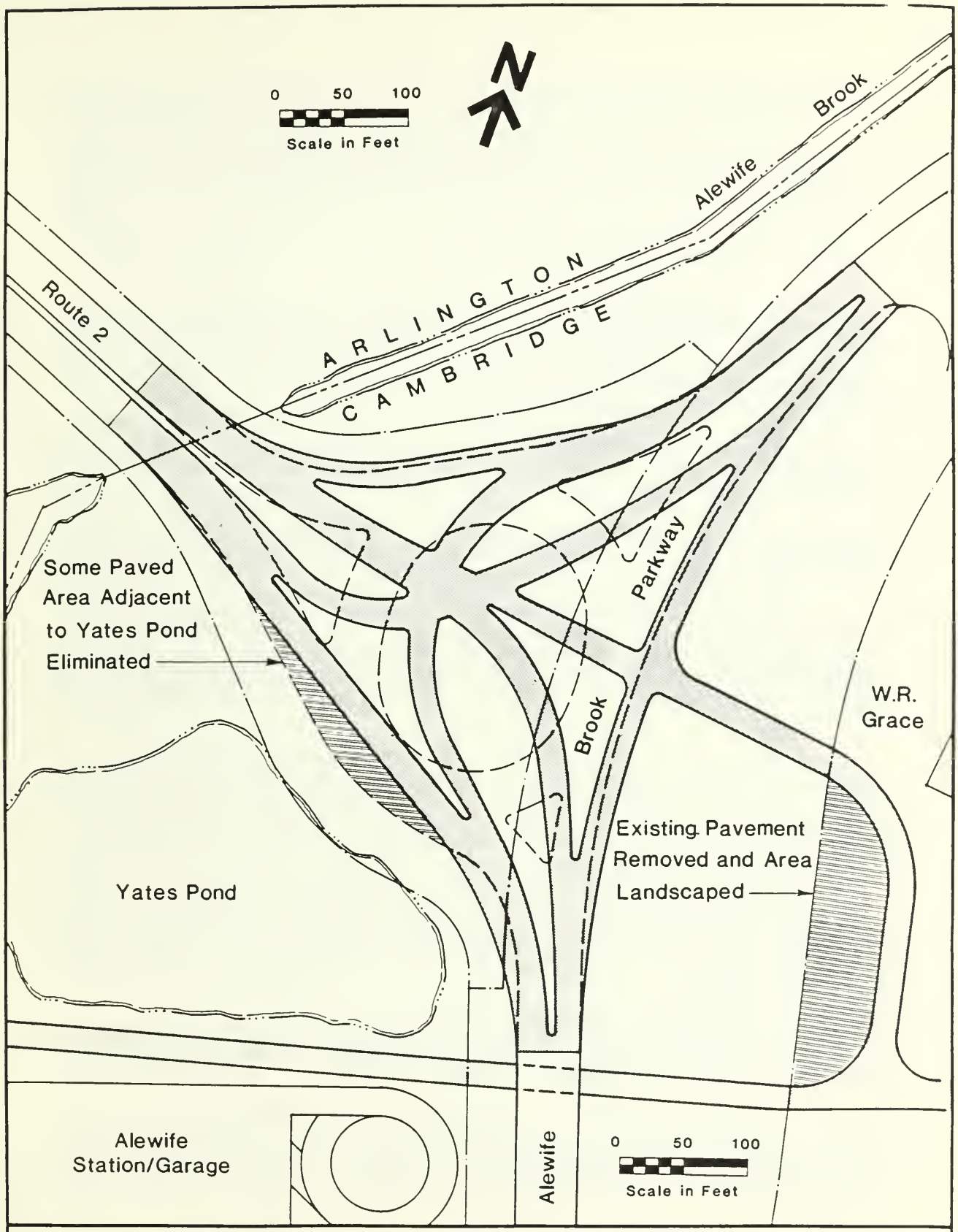
Measures to Mitigate

Figure IV-A



Measures to Mitigate

Figure IV-B



Measures to Mitigate

Figure IV-C

D. COMPENSATORY FLOOD WATER STORAGE

The Interim Access roadways involve some filling in a flood plain and therefore result in a displacement of a volume which would have previously been available for storage of flood waters during a flood condition. To mitigate this impact, the first step was to reduce the displacement volume. This has been achieved by keeping the roadway as low as practical through the flood plain area and by using retaining walls wherever practical to minimize the need for side slopes which eliminate storage volume.

On the inbound roadway the road surface has been lowered as far as elevation 7.5 DPW Base, which is consistent with a less stringent 50 year flood design control rather than a 100 year flood design control, and a retaining wall, eliminating side slopes, has been provided along the south side of that roadway, facing the floodplain, from near Acorn Park Road to the northerly abutment of the bridge over the Little River.

On the outbound roadway, the road surface has also been kept as low as is reasonably possible and a retaining wall to eliminate side slopes has been provided along the north side of the roadway facing Yates Pond.

Using these reduction measures, the total storage displacement in the flood plain as a result of the access roadways has been held to 183,000 cubic feet.

The second mitigation approach is to provide compensatory flood storage to replace the volume lost due to the filling for the access roadways. This compensatory storage is provided by cutting away and removing material in another area of the flood plain as described above in Replacement of Wetlands so that the volume thereby made available for flood water storage equals that volume lost by filling.

The area of the flood plain located to provide this compensatory storage lies along the northerly side of the Fitchburg Freight Cut-off railroad track to the west of the Alewife Station Area. This strip of land along the railroad tracks, approximately 100 feet wide and 1,100 feet long, contains mounds to heights of as high as elevation 10 DPW Base which can be cut down to provide the required compensatory storage.

This area can be cut down to as low as elevation 3 DPW Base which is consistent with the elevation of the adjacent wetlands. In fact, it is anticipated that the low lying area created for compensatory flood storage will assume the appearance of the adjacent marshland, as described in the Replacement of Wetlands Section.

The selective removal of some of the man-made uplands and enlargement of the wetlands within the Reservation is consistent with the concept that the Reservation should serve both as a wild preserve and as a water retention area.

The compensatory flood storage provided is greater than the filling due to the access roadways at all intermediate elevations between the normal water elevation of 1.6 DPW Base and the 100 year flood elevation of 8.3 DPW Base. At the 100 year flood elevation of 8.3 DPW Base, the limiting case, the

Compensatory flood storage provided is 185,000 cubic feet, slightly greater than the total flood storage displacement due to filling of 183,000 cubic feet.

The proposed compensatory flood storage areas are shown in Figures IV-A and IV-B and the compensatory flood water storage calculations are in Appendix I.

E. OTHER HYDROLOGICAL CONTROLS

The freight cut-off right-of-way, being a raised berm, functions as a flood control device under certain circumstances. This is a valid function and therefore it is proposed that the berm be maintained as part of the railroad corridor which is to be retained.

The structure spanning the Little River will have sufficient clearance and span so as not to impede the normal flow of water. The bottom of the structure will be at the same elevation as the structure that previously supported the railroad across the river. Thus vertical clearance will be the same as before.

Storm water run-off from the Interim Access roadways will be piped to the river. Run-off will not be discharged into Yates Pond and will not be discharged at a velocity sufficient to cause scouring. Pollutant traps will be included in the closed conduit drainage system to the extent practicable.

The two overall affects of the impermeable pavement associated with the project, an increase in runoff quantity and a decrease in runoff quality, are unavoidable. A variety of mitigation measures have been considered and are discussed below.

1. Mitigation Through Maintenance Policy Choices.

There are no measures available to reduce the quantity of runoff generated through maintenance.

The decrease in the quality of runoff could be lessened if roadway salts were not applied as part of winter maintenance. However, since salt would continue to be applied to Route 2 and Alewife Brook Parkway, which drain into the same general area, this reduction would be of little consequence. Also, restrictions on the use of roadway salts are usually seen as a safety compromise which is not justified unless a public water supply is involved and that is not the case in the Alewife area.

Frequent cleaning of the roadways would lessen the contamination level of the runoff. However, since storm frequency in this area is relatively high, the frequency of cleaning would have to be beyond that of usual maintenance practices.

2. Mitigation Through Material Choices

A porous pavement on the roadway surface has the advantage of allowing some infiltration into the soil to take place thereby decreasing the quantity of runoff. Porous pavement, however, is more prone to wear than normal pavement

and is not usually considered suitable for areas of heavy traffic use. A standard highway pavement such as will be necessary on this project is several inches thick and of a very dense consistency and will be almost completely impermeable.

No mitigation measures are available through material choices to reduce the change in runoff quality.

3. Mitigation Through Design Choices

In order to promote infiltration where possible, sidewalks will be sloped to drain away from the roadway onto slopes where possible. The sidewalk runoff, which is anticipated to contain considerably less oil, grease, and salt than the runoff from the travel lanes, will be slowed and to come extent absorbed by the vegetation. By travelling overland rather than entering a closed system, more opportunity for infiltration into the soil is provided. Also, perforated pipe can be used in place of normal impermeable pipe to allow some of the runoff to infiltrate into the soil as it is conveyed.

Storage areas, either above ground or below ground, are used to control runoff to allow for settlement, separation, or dilution of contaminants to take place. The main requirement of a storage approach is space and that is particularly lacking in the Alewife area. Because of the sensitive nature of the surrounding reservation, the extent of construction has been severely restricted and providing a storage area for runoff would be inconsistent with this approach.

The runoff from the travel lanes of the new roadways has the greatest potential for contamination by oil and grease. This runoff requires oil trapping as part of the drainage system before its eventual outfall into the waterways. Unfortunately, there is no practical method available for the removal of salt from runoff.

F. TREATMENT OF OPEN SPACES

The access ramps were deliberately designed to minimize their impact on the MDC Reservation. Sensitivity to this relationship is demonstrated as follows:

1. The access ramps would be located in the least sensitive area of the MDC Reservation.

The Red Line Northwest Extension Final EIS found that "For wildlife considerations, the most valuable area of the Alewife wetlands is generally the Alewife Brook Reservation West. This area contains a great diversity of plant species and life forms; is well buffered from most of the urban setting; and has a more favorable interspersion of both water and vegetation than the remaining portions".

The MAPC Open Space Study, in its Technical Memorandum: Alewife Open Space-Vegetative Communities and Wildlife Habitat, undated, concurred. It found that the section of the Alewife Reservation affected by the Red Line Extension

ranked low both in diversity of vegetation and in remoteness from disturbance "by people and their pets, reduced noise, etc.". In contrast, the area of the Reservation in Belmont lying between Little Pond and the A. D. Little property ranked high in both diversity and remoteness, and three other sections of the Alewife Reservation West ranked high in one category and moderate in the other.

2. The access ramps avoid bisecting any previously undisturbed open spaces. The inbound ramp runs as close to the existing Route 2 as possible and then utilizes the Lexington Branch railroad right-of-way which was in existence before the area became public parkland. The outbound ramp also uses a railroad right-of-way which predates the Reservation and then passes through an area previously occupied by a chemical plant.

3. By using the 50-year storm as the design standard rather than the 100-year storm, the profiles of the inbound ramp across the Reservation and of the outbound ramp adjacent to Yates Pond will be lower, causing less of a visual intrusion into areas of open space.

4. With the exception of the loop formed by the outbound ramp east of the Parkway, in every instance where the ramps abut wetlands, parklands or other open space, a pedestrianway/bikeway is placed between the roadway and the abutting area providing direct pedestrian access to the Reservation.

5. Despite the temporary nature of the access ramps, landscaping will be provided with the existing wild, natural vegetation described earlier in the description of the inbound ramp.

6. Lighting will be designed to avoid unnecessary visual intrusion.

7. Areas of the Reservation abutting the roadways but unaffected by construction will be cleaned as required.

8. Design of the replacement parklands, wetlands and compensatory flood storage areas will be compatible and consistent with the plans advanced in the MAPC Open Space Study and with comparable MDC natural reservation areas.

G. CONSTRUCTION STAGING CONTROLS

Due to the nature of construction activities, operations tend to extend beyond the limits of the roads themselves. These operations include storage of materials, temporary access roads and related activities. Construction activities are controlled by providing specification conditions that require the contractor to develop a work program within certain limitations. For this project it would include as a minimum:

a. All conditions imposed by the regulatory agencies/commissions.

b. Restoration of all impacted areas.

c. Limiting work areas by placement of construction fencing.

d. Strict monitoring of the contractor.

e. Erosion protection measures.

f. Maintain existing roadway capacities in terms of number of travel lanes.

A temporary fence would be constructed a little beyond the lower wall of the inbound ramp before start of construction to exclude construction vehicles and minimize damage to the unique Staghorn Sumac grove between Route 2 and the A. D. Little parking lot. Other such restraining barriers will be installed, as potential impacts on sensitive locations are identified during construction.

Between Route 2 and the garage, construction impacts will be contained within the previously described temporary construction easements.

The most critical construction controls relate to the conversion of the rotary into a signalized intersection. As described earlier this will be done in six stages. The main emphasis will be on safety. Measures used will include temporary signals, temporary pavement and pavement markings, temporary curbing and highly visible movable barriers as required.

Construction noise will be generated by heavy equipment such as cranes and bulldozers. Pile drivers may be used in the construction of the retaining walls along Route 2 and jackhammers may be used in removal of pavement at the Concord Turnpike/Alewife Brook Parkway intersection. The construction contractor will be required to maintain noise control procedures in order to minimize adverse impacts.

The proposed construction will not impact any major utilities.

Debris and spoil will result from reconstruction of the Concord Turnpike/Alewife Brook Intersection. To the extent the materials meet applicable construction specifications, they will be reused on the construction site. Any remaining debris will be properly disposed of off site in accordance with applicable laws.

Measures will be used during construction to control dust emanating from construction activities such as excavations, hauling, stockpiling and backfilling in accordance with applicable regulations.

There is no business disruption anticipated as a direct result of the proposed project.

H. TRAFFIC

One of the by-products of traffic congestion at the Route 2 Rotary and the Rindge Avenue-Alewife Brook Parkway intersection is diversion of traffic into other streets in Arlington and Belmont. The reconstruction of the Route 2 rotary will affect all Route 2 and Alewife Brook Parkway traffic. It is essential that all those existing movements be provided for during the construction period to miminize further diversions into local streets.

This impact is mitigated by the staged construction of the ramps and new Route 2-Parkway intersection described in Section III-C. Of paramount importance to the construction strategy proposed is that both the inbound and outbound ramps be built and put to use as quickly as possible.

One of the more significant safety issues is the Route 2 inbound approach leg to the rotary area which changes from a 4 lane expressway section west of Lake Street to a 2 lane arterial at the rotary. While the longer-range, MDPW EIS study would determine the ultimate character of this roadway, the inbound access ramp will ensure that improved traffic operations can occur during this interim period. The Preferred Alternative removes some 1,023 vehicles at the inbound ramp during the AM peak hour, leaving some 2,332 vehicles approaching the intersection. This 30 percent reduction will ease the operations in the revised rotary area.

A series of information, directional and warning signs and signals, which will indicate the forthcoming decisions required and direct vehicles to proper lanes and proper speeds should encourage safer operations than exists today.

V RESPONSES TO COMMENTS ON THE DEIR

The format and content of the Final EIR was heavily influenced by the comments and concern expressed by the agencies and individuals who reviewed and commented on the DEIR. Every effort has been made to incorporate responses to the comments in the text of the Final EIR.

On the following pages, the comments requiring response have been extracted from the letters received. Where appropriate, the response makes reference to the section of the Final EIR where the issue is addressed. In some instances, the nature of the comment makes a direct response more appropriate, so the response is included on the following pages, following immediately after the comment.

A. EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

A-1 Comment: "The original 1976 Red Line EIR indicated that new ramps were not required for the MBTA station and garage to function on its initial opening. On page 25 of the Interim Access EIR, this view is reinforced by the statement that the reconstruction of the Rindge Avenue/ Alewife Brook Parkway intersection would be "adequate for the station and garage alone" until the Mass DPW completes its long-term roadway project. However, traffic generation data in the Interim access EIR indicates that 1985 MBTA traffic alone would be sufficient to cause AM peak-hour capacity to be exceeded by 20 percent at Rindge Avenue, with no development growth. The FEIR should explain and present calculations indicating whether or not interim access improvements are warranted for MBTA operations alone."

Response: The Red Line EIS's conclusion was based on development and traffic assumptions that have become somewhat outdated in the intervening years. It is particularly difficult to review the current base year (1982) volumes and determine what portions of those volumes are due to normal growth and what portions are due to recent development in the area compared to the Red Line EIS base year volumes of circa 1975 and the projection year volumes of 1980 and 1985.

It should be noted that the 1982 volumes cited in the DEIR are counts of actual traffic going through the old intersection. The v/c counts show that this intersection is operating at capacity levels. As of 1982 there was most likely additional demand at the intersection remaining unsatisfied. This additional demand is currently being stored in queues and is using other streets in surrounding communities.

The 1987 analysis year volumes are projections of demand at the intersection. Where calculations of v/c ratios of these future demand volumes yield v/c ratios greatly in excess of capacity, the indication is that that demand could not be satisfied by the particular design alternative. In such cases, the excess of demand over capacity would either form queues, stretch out the peak period, divert to other facilities or most likely utilize some combination of the above.

The following are calculations of v/c ratios at the Rindge Avenue-Alewife Brook Parkway intersection:

		A.M.	P.M.
1)	1987 No Build (Projected Demand) With new intersection and with only MBTA traffic on Rindge Avenue Extension	1.31	1.00
2)	1987 No Build (Projected Demand) With new intersection and combined MBTA and development traffic	1.39	1.46
3)	1987 Alternate 4 (Projected Demand) With new intersection and combined MBTA and development traffic	1.25	1.02

These calculations indicate that v/c ratios of projected demand yield values greatly in excess of capacity which means that future actual volumes in 1987 will take longer to pass through the intersection. The preferred alternative (line 3) has the lowest v/c ratios (albeit still in excess of capacity), but has the benefit of rerouting over 50 percent of the garage bound traffic out of the intersection.

Thus, in comparison of lines 1, 2 and 3, the preferred alternative is clearly superior.

A-2 Comment: "How does the peak-hour traffic generation from the MBTA station compare to peak-hour development traffic?"

Response: The MBTA would generate approximately 25 percent of the total of MBTA and development peak-hour traffic for the 1987 forecast year. The following table shows a summary of the traffic projections.

A.M. Peak Hour	Development Traffic	MBTA Traffic	Total Traffic
To sites	3,286	1,200	4,486
From sites	1,016	200	1,216
Total	4,302	1,400	5,702
P.M. Peak Hour			
To sites	995	200	1,195
From sites	3,511	1,200	4,711
Total	4,506	1,400	5,906

The development traffic volumes shown above are the total projected volumes generated by the triangle, quadrangle, Grace, ADL and other smaller developments in the Alewife area.

A-3 Comment: "Although the Mugar development in Arlington has fulfilled its MEPA requirements, the Interim access EIR does not include any allowance for Mugar by 1987."

Response: In accordance with the MEPA scope, it was assumed that Mugar development generated traffic would occur only after decisions had been made about the construction of the permanent Route 2 improvements. Under those circumstances, the projection of Mugar development generated traffic is a function of the MDPW EIS now underway.

A-4 Comment: "The EIR does not attempt to assess impacts beyond 1987. However, it is realistic to assume that interim access may be required to function into the 1988-1990 period as well, and possibly beyond. . . Cambridge projections indicate that ultimate development would be four times the development utilized in the Interim Access EIR. Stated another way, the 1987 development growth represents only 1/4 of the ultimate growth projected by Cambridge. These development traffic issues are critical in terms of understanding the effectiveness of the interim road proposals and the ability of the street and parkway systems to handle additional traffic."

Response: The 1987 target year was selected in compliance with the EOEA request, made on page 5 of the Scope for the EIR: "For convenience, the traffic volumes utilized should be based on the 1987 Phase II Build traffic volumes indicated in Figure VIII-A-1 and 2 of the Final EIR for Cambridgepark (EOEA #4512) prepared for Spaulding and Slye."

During the initial phase of this study, the development quantities in the Cambridgepark EIR were reviewed and revised according to the best estimates then of the development quantities expected to be in place in 1987. While there was some internal reallocation of quantities among the various developers, the 1987 totals of the Cambridgepark EIR and this EIR are within a few percent of each other. Table VI-A on p. 69 of the DEIR displays the specific quantities for each development.

At no time have the Interim Access roadways been represented as an adequate long-term solution. In fact, one of the guidelines consistently followed in the development of the alternatives has been that "any temporary roads should facilitate rather than impede the earliest possible completion of permanent road improvements".

A-5 Comment: "...what were the modal split assumptions utilized for various developments?...What figures were used for existing and future auto-occupancy rates?"

Response: The mode split and vehicle occupancy assumptions for the various developments were taken from the Cambridgepark EIR (EOEA #4512) because the 1987 future traffic volumes were also taken from that EIR. While there was some slight variation among the various development sites, the average modal split to the Alewife area was about 30 percent transit and the vehicle occupancy was 1.3 persons per automobile.

A-6 Comment: "What is the capability for the Red Line in the short term (1985-1987) to handle additional passengers?"

Response: The capacity constraints are now, and will probably continue to be, on the South Shore leg of the Red Line. Plans for increasing capacity include the addition of 54 cars to the fleet by 1986 and the completion of the lengthening of all Red Line platforms to accommodate six-car trains.

If all South Shore and Ashmont trains were operated to Alewife, adequate capacity would exist under present or future conditions. However, in order to alleviate South Shore crowding, some trains would probably be turned back, both under existing and future conditions. After the new equipment is added to the fleet, with all trains operating to Alewife, the peak-hour capacity would be 1,080 riders every 4-5 minutes, or 240 riders per minute, or 14,400 per hour. The scheduling of turn-back trains would probably be adjusted as required to assure that adequate capacity is maintained at Alewife.

A-7 Comment: "Banning development traffic from the ramps would be difficult to implement, so the Final EIR should emphasize the situation with combined traffic on the ramps."

Response: Although limiting the traffic on the ramps to garage traffic could be explored as a possible traffic management technique, the difficulty of implementing such a practice is recognized. Substantial office and research development is occurring in the so-called Triangle area, adjacent to and west of the station. As a practical matter, it is recognized that the traffic generated by these activities would likely use the interim garage access to by-pass the congested Rindge Avenue intersection. The roadway design takes into account the probability that the road would absorb both the Alewife Station garage and area development traffic.

A-8 Comment: "The primary limitation in the DEIR traffic analysis is the failure to deal with the effects of turn blockage, treatment of two-lane left turns, and the handling of rotaries. The latter problem is most severe, because the EIR suggests that present-day traffic volumes exceed capacity by factors of 3 to 4 at the Alewife rotaries, which clearly is not the real-world case. Generally, traffic now moves remarkably well through the rotaries and they are not the traffic flow bottleneck--the Rindge Avenue signal is the present bottleneck for both morning and afternoon periods. The Final EIR must substantially revamp the analysis of rotary capacity to show proper calibration and thus become more realistic and useful as a prediction method at Alewife..."

"The EIR also includes some questionable handling of signal phasing and turning movements, but overall, the intersection calculations are credible and useful for a Draft EIR.

"One significant exception is the afternoon peak-hour performance of the new signalized intersection replacing the Route 2 rotary. MBTA officials are aware of problems of the design as shown in the DEIR, which currently has a pair of two-lane movements immediately merging into a

2-lane section during the same signal phase. Traffic demand does not match capacity, as the DEIR claims, but rather may exceed capacity by 40 percent. The congestion and safety implications of this sudden merging are evident, and the consultants are not considering merging 2 plus 1 lanes into either two or three lanes. Such issues have critical capacity and safety implications, and the new intersection (Alternative 4 Modified) must be carefully assessed in the Final EIR for engineering feasibility. The Massachusetts DPW should be specifically contacted for their comments..."

"...the new signalized intersection at the Route 2 rotary is likely to operate much worse than the DEIR indicates, both in terms of capacity and safety. It will probably constitute the new bottleneck for both morning and afternoon peaks. Existing congestion would be worsened unless at least 10 percent of the entering traffic diverted to other times or routes (300-500 cars). The diversion would have to be as high as 30 percent with the currently proposed intersection design..."

"Alternative 4 needs considerable attention to the intersection design and the merging of outbound traffic. Ultimately, there may be a requirement to have three lanes leaving the rotary area and heading outbound on Route 2. This action may require slight widening and use of the existing Route 2 breakdown lane as a travel lane."

Response: The response to these comments is contained in Appendix E-Route 2 Rotary Issues and in Section III-C.

A-9 Comment: "The effect of turn blockage was identified during Advisory Committee discussions in response to the observation by Richard Sheridan that traffic volumes at Rindge Avenue exceeded capacity by 25 percent for all alternatives in the 1987 AM peak, including the No Build. Such results implied that any of the Build alternatives do not improve bottleneck capacity and thus are quite difficult to justify. These same results are carried through into the Draft EIR, and the same questions apply. Considerations of turn blockage should have been included in the calculations (and must be included in the Final EIR), and this factor will indicate that excess volumes can be reduced from 38 percent for the No Build case to 6 percent for Alternative #4. In other words, Alternative #4 does a better job of handling traffic at the Rindge Avenue bottleneck than is indicated by the Draft EIR, and allows for a capacity improvement of about 1/3."

"While Alternatives 3 and 3A do comply with the scoping requirement that at least one alternative avoid crossing Little River/Alewife Brook, the improvements are primarily one way (outbound from the station) and do not deal with the morning peak flow into the station. This situation could be improved by extending the right-turn lane on the Parkway into Rindge Avenue Extension from its current match with the existing 40-foot parkway near the old Freight Cut-off Bridge--to the Route 2 rotary. Thus a continuous right-turn lane would be available from the rotary to the MBTA Station, and there would be no turn blockage effect at Rindge Avenue. The traffic results appear to be equal or better than Alternative 4, with lesser impacts on the Little River area. The Final EIR should explore the benefits of this approach."

Response: The right turn into Rindge Avenue Extension from Alewife Brook Parkway southbound is the most critical turn during the morning peak period. The effect of this turn was analyzed differently in the DEIR than in the EOEA comments. The morning analyses has been recalculated using the EOEA techniques and the v/c ratios obtained are similar to those arrived at by EOEA.

The right-turn lane can accommodate about 25 vehicles per traffic cycle or about 750 vehicles per hour before the straight lane would block the right lane. This blockage affects only the No Build alternative and Alternative 3a which have no inbound interim access roadways. Under these alternatives, the right-turn lane must accommodate about 1,850 right-turning vehicles per hour.

For Alternatives 1, 2 and 4, the inbound interim access roadway reduces the right-turn lane volume to about 620 vehicles during the morning peak hour. Even this lower volume would be periodically blocked due to random arrival patterns, but the volume is low enough to clear the right-turn lane as a part of the southbound green phase. In other words, the right-turn volumes in these alternatives do not need a total, free-flowing right-turn condition to operate satisfactorily.

The EOEA suggests continuing the right-turn lane all the way back from Rindge Avenue Extension to the rotary area as a potential alternate to providing the inbound interim access roadway from Route 2 near Acorn Park Roadway.

This suggestion has three potential problems.

First, to be as effective as Alternatives 1, 2 and 4 in handling inbound Route 2 traffic destined for the garage, the suggested extended Alternative 3a lane would need to be separated from other traffic from a point on Route 2 west of the rotary. A second lane would be required to accommodate southbound Parkway traffic destined for the garage. Widening the Parkway to the extent required would not be reinforcing Parkway values and would impact Yates Pond.

Second, if the extended lane permitted any traffic emerging southbound from the rotary to enter it, it would induce a very short weave of the Parkway traffic from the Massachusetts Avenue direction to the right-turn lane. This traffic must cross the Route 2 inbound traffic which is destined for the straight lanes on the Parkway heading southerly of Rindge Avenue.

Thirdly, all of the right-turning traffic (some 1,850 vehicles) would have to make the right-turn at Rindge Avenue. This volume itself would overreach the capacity of a right-turn lane. Further, this traffic would also have to merge with the 630 vehicles turning left into Rindge Avenue Extension from Alewife Brook Parkway northbound.

In view of the availability of other Build alternatives which reduce congestion at the Rindge Avenue extension, avoid introducing a merge and weave problem on the Parkway, the suggested extension of the right-turn lane to or beyond the rotary would appear to be an imprudent action.

Concerning the evening peak hour, the left-turn out of Rindge Avenue Extension is a critical movement and is estimated at about 1,980 vehicles per hour. The DEIR and the EOEA had differing methods of analyzing this left turn, but both came to the same conclusions. In the No Build Alternative, where no separate facility would reduce this demand, the v/c ratios would exceed capacity by 50 percent or more.

All of the Build alternatives (1, 2, 3a and 4) provide a separate roadway for up to two-thirds of this left-turn demand and allow for v/c ratios below or near capacity levels under either the DEIR or EOEA analysis techniques. Thus, while the methodologies differ somewhat, the general conclusions are the same: a Build alternative substantially reduces congestion at this critical intersection and makes a significant improvement to maximize garage operations.

A-10 Comment: "The queuing analysis summarized in Table II-1 appears of limited utility. Why are the afternoon queue lengths the same for all build alternatives at Rindge and Alewife, even though the V/C ratios are quite different? How was a queue length of 64 vehicles estimated for the No-Build case, when the V/C ratio is 1.46?"

Response: As stated in the comment, this queuing analysis is of somewhat limited utility. The queue lengths were arrived at through the air quality analysis rather than through a traffic analysis.

The ITE Transportation and Traffic Engineering Handbook provides a queue-delay formula technique for estimating queue lengths. An attempt to use this methodology failed because the formula is valid only when the sum of the critical lane volumes does not exceed 1,600. For the preferred alternative, this sum is about 2,100 in the AM and about 1,700 in the PM.

A simplistic approach which assumes about 30 traffic cycles per hour and about 2,000 vehicles over 2 lanes on Alewife Brook Parkway southbound in the AM peak would yield an average of about 33 vehicles per lane per cycle. This type of load intensity does not lend itself very well to a Poisson type of distribution, but if it did, the queue length for about a 95 percentile would be about 40 vehicles per lane for the preferred alternative.

A-11 Comment: "How were the diversions derived? The similarity of traffic volumes for the AM and PM periods suggests that these diversions were determined independently of the alternatives and their intersection capacity problems..."

"If a preferred alternative is selected prior to the Final EIR, this alternative should be analyzed for the likely trip diversions which would be necessary for all intersections to function. Demand should be reduced and redistributed until demand, volumes and capacity are equal at the worst bottlenecks. For the purposes of this analysis, development assumptions for 1987 should be kept constant..."

"The intersection of Brighton and Cross Streets in Belmont appears to be the major controlling flow bottleneck for the Brighton-Blanchard detour route around Alewife. How much more traffic can this route take before intersection congestion is the primary control? Does the EIR analysis allow for the pedestrian signal phase at this signal? How does the analysis of the Concord Avenue/Blanchard Road intersection compare with observations of current peak hour traffic, with the existing traffic signal timing?"

Response: In a constrained or congested situation, traffic will shift or divert to alternate routes. The amount of such diversions is, of course, a function of many factors such as the degree and longevity of congestion, the availability and congestion of alternate routes and the destination of vehicles.

The degree of congestion levels at the Route 2 rotary and the Rindge Avenue intersection are the most severe under the No Build alternative. Much of the inbound traffic on Route 2, Massachusetts Avenue and Concord Avenue is destined easterly of Alewife Brook Parkway which forms a natural northsouth screenline. Such traffic destined easterly of this line must cross the line at either the Massachusetts Avenue intersection or the Concord Avenue rotary.

Inbound traffic on Route 2, finding varying levels of congestion at the Route 2 rotary, would tend to shift to either of the two alternate routes; Concord Avenue or Massachusetts Avenue. The primary diversion route to Concord Avenue would be Blanchard Road and the similar route for Massachusetts Avenue would be Lake Street.

Trips on Route 2 can be considered to have three types of destinations. The first type would be those destined for the general Alewife area and are unlikely to divert in large proportions because the alternate route would be a more circuitous route to their destination.

The second type of trips is those with destinations generally easterly of the Alewife Brook Parkway screenline. Some of these are likely to divert, but would still be faced with similar (albeit, somewhat lower) levels of congestion at the Massachusetts Avenue intersection or at the Concord Avenue rotary.

The third type of trip is that trip destined for the MBTA Alewife Station. Over 800 of the 1,000 MBTA trips come from a combination of the Route 2 and the Massachusetts directions and must pass through the Route 2 rotary. About half of the 800 plus trips are estimated to be existing trips on these roadways and the other half would be new trips to the Alewife Station.

The major diversion assumption is that, in the most congested situation (No Build), that the new trips to the Alewife Station would not be made and would rather continue as automobile trips to destinations easterly of Alewife Brook Parkway. The inbound trips to the Station were then reduced from 1,200 to 800 trips and these trips were reassigned to the Concord Avenue from Massachusetts Avenue corridors easterly of Alewife Brook Parkway.

For the evening peak hour, the mirror image situation was assumed and diversions were reassigned accordingly.

The EOEA comments noted that diversions should be redistributed until they are equal at the worst bottlenecks and further noted that the intersection of Brighton and Cross Streets appeared to be the major controlling flow bottleneck. Additional diversions were assigned through the paths of this intersection until its capacity was exceeded. No provisions for pedestrian phasing at this intersection was considered at this time.

A-12 Comment: "...despite the best efforts of the transportation engineers and the Alewife Transportation Advisory Committee, the intensity of local traffic growth overwhelms these efforts, and indicates that development schedules and intensity are out of balance with the ability of transportation systems to respond with the methods suggested to date."

Response: The interim access proposal has a relatively modest yet important objective: it is to facilitate the movement in and out of the Red Line terminal for an interim period while more adequate permanent solutions are defined, accepted and implemented.

A-13 Comment: "Traffic management is no longer a luxury or even an option; for Alewife, it must be seen as a necessity. The initiative of the Mystic River Watershed Association has been responded to in Appendix G of the Draft EIR, with the overall conclusion that there is no pressing need to pursue the special initiatives outlined by MRWA. However, traffic management options provide the only options (short of development controls) which will significantly help the transportation system at Alewife to function. In consideration of traffic problems at Alewife, this approach should be reconsidered and the MBTA/EOTC should prepare a monograph to revise their thinking and approach to reducing vehicle trip generation in the Alewife area during peak periods. This monograph should precede circulation of the Final EIR and should be discussed with the Alewife Transportation Advisory Committee."

Response: The monograph requested is incorporated in the FEIR as Appendix G. The measures proposed are included in the FEIR, Section III-K Supplementary Transportation Systems Management Actions.

Application of traffic management techniques is an essential ingredient to any traffic handling solution in the Alewife area. The initiative of the MRWA is for the application of TSM measures as part of the No Build alternative. The conclusions drawn in Appendix G are that the MRWA proposals do not provide the benefits of a Build option.

A-14 Comment: "...the Mass DPW should be contacted for data on historical traffic growth on Route 2. The Department maintains a permanent counter station on Route 2 near Lake Street, and the historical trends of traffic growth from 1950-1984 should be provided as background information on Alewife growth."

Response: It is recognized that the pattern of historical traffic growth on Route 2 has been influenced by construction of the rotary decades

ago, by the widening and grade-separation of Route 2, by local area development growth and by the general growth of the core area.

This EIR is intended to resolve short-term, interim issues related primarily to the planned opening of the Alewife Station. This EIR has proceeded understanding that the MDPW is concurrently proceeding with the development of a longer-term EIS which will address the issue of integrating Route 2 into Alewife Brook Parkway in a manner which respects the various competing interests in the general area.

It would appear that the compilation of historical traffic data for this EIR would be of marginal utility since that same task is being performed in the now ongoing Route 2 EIS and the analysis and interpretation of that data will be a part of the Route 2 alternative investigations.

A-15 Comment: "Table II-1 shows identical wetlands impacts (3,200 square feet) for both Alternatives 3A and 4, although the latter involves considerably more construction. This issue should be resolved in the Final EIR."

Response: According to the maps received from the Arlington and Cambridge Conservation Commissions, the inbound ramp of Alternative 4 does not affect any wetlands. Thus the wetlands impacts of Alternative 3a and Alternative 4 are the same.

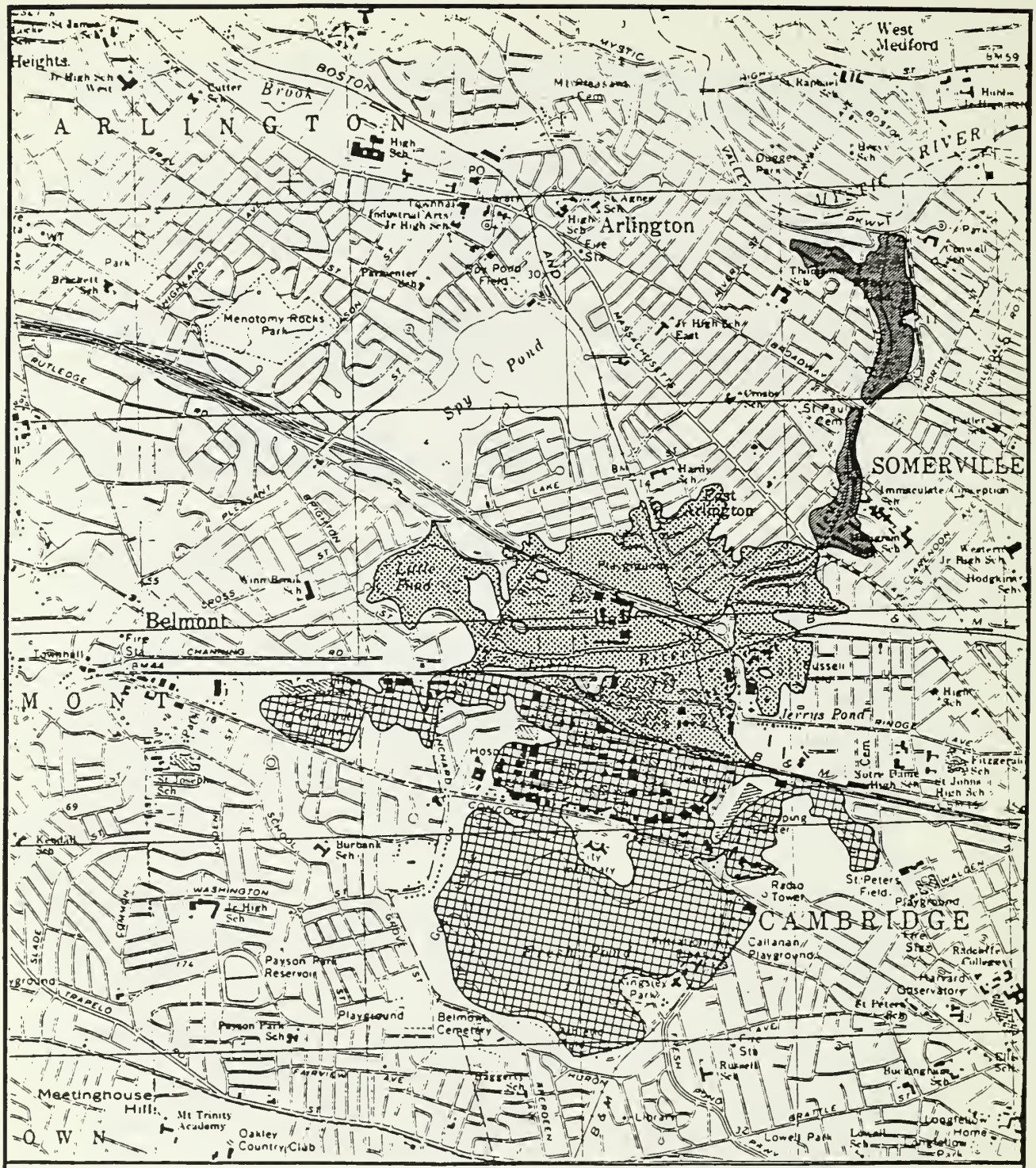
A-16 Comment: "The floodplain map on page V-B does not show the full extent of 100-year flooding. The Final EIR should also include a Figure V-G showing the 100-year elevation for the triangle and MBTA station area. Information from the ADL Draft EIR (EOEA #4957) should be utilized, along with suitable mapping to show the floodplain area and representative flood water depths at proposed ramp locations. Note that the ADL EIR estimated the 1955 flood of record to be a 30-year event, rather than a 100-year storm, with flood elevations of 6.9 USGS. However, the Interim Access EIR indicates the 1955 flood elevations were 7.4 on the USGS datum. The Final EIR should resolve these discrepancies."

Response: The basis of the flooding calculations used in the DEIR are the Resources Analysis report for Alewife Station and the Camp, Dresser and McKee report for the Mystic River. These reports have been the basis of all the Red Line work at Alewife and have been accepted by all regulatory agencies.

The Interim Access DEIR and the ADL DEIR are in essential agreement on the 100-year flood elevation. The Alewife Interim Access DEIR reports it at 8.28 USGS datum and the ADL DEIR reports it at 8.3 NGVD (USGS).

A copy of Figure 3-15 from the ADL DEIR showing the 100-year floodplains for the Alewife area is attached as Figure V-A.

A-17 Comment: "Where will the 204,000 to 223,000 cubic feet of compensatory storage be achieved? What areas of compensatory storage have already been claimed for the construction of the MBTA station and garage? Plans for such storage must be provided as part of the Final EIR."



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100-YEAR FLOODPLAINS

Downstream

Little Pond to Massachusetts Avenue

Upstream

JASON M. CORTELL and ASSOCIATES INC.

Figure V-A

Response: Plans for compensatory storage are described in Section IV-D.

A-18 Comment: "The roadway ramps represent a major and permanent use of MDC parkland, and there should be efforts to mitigate such impacts through the provision of at least equal area and quality of wetlands/parklands to be returned to the MDC to stabilize or increase the Alewife Reservation."

Response: The Interim Access project requires the taking of 0.8 acres of parkland out of Reservation total of 124 acres. The plan for replacement of parklands and wetlands are described in Section IV-B and IV-C, respectively.

A-19 Comment: "The aesthetics of the MDC parkway system must also be considered. The roadways retain considerable potential in addition to existing landscaping and aesthetic value. The interim roadway improvements should be assessed in terms of having long-term potentials for landscaping. Specific provisions should be defined for ways to reinforce parkway values and compensate for pavement widening.

"What specific coordination or suggestions are appropriate relative to the MAPC Open Space Study?"

Response: The enhancement of the MDC reservation, the reinforcement of parkway values, and relationships with the MAPC Open Space study are discussed in Section IV.

A-20 Comment: "Who owns the land over the Red Line tunnel: MDC or MBTA? Does the MBTA own the old railbed connecting the Bedford Branch with the Freight Cut-off--including the at-grade crossing of Alewife Brook Parkway?"

Response: The land over the Red Line tunnel is owned by the MBTA except for a small triangular parcel near Yates Pond. The old railbed involving the at-grade crossing of the Parkway was never acquired by the MBTA.

A-21 Comment: "The Interim Access alternatives should be briefly assessed in terms of construction phasing at key bottleneck areas. The reconstruction of the Route 2 rotary will present special problems."

Response: Construction staging controls are discussed in Section IV-G.

A-22 Comment: "The issue of safety is mentioned briefly in the EIR (page 39, page 63) but there are no figures or analysis. Route 2 is identified as a high-accident area, and the rotaries as high-accident locations. No substantiating data are offered. Although there has been considerable interest in safety issues over the years, the Alewife area has had only one safety study in recent years: the Arlington Office Park Draft EIR (Mugar, EOEA #4167). This report indicated that for the years 1979-1980, only six accidents were reported at the Dewey and Almy traffic circle. All were of a minor property damage nature, and only two occurred during the peak hour period. This probably results from driver familiarity

with the location, the absence of lateral friction such as uncontrolled access and parked cars, and the relatively low vehicle speeds due to the relatively high peak-hour volumes (page IV-A-23). This rotary was laid out in 1933, and as recently as 1970, there were a reported 50+ accidents a year reported. Changes which have occurred since then have been No fault insurance, sidewalks and pedestrian overpass, with median guardrail and other minor road changes. The data now available suggests that the Route 2 rotary is the safest intersection in the area, and that the 1968-vintage Lake Street ramps have a much higher accident incidence."

Response: The source of the statement in the DEIR that the Route 2/ Alewife Brook Parkway is a high accident location was the accident analysis undertaken in the Cambridgepark DEIR (Spaulding & Slye, EOEA #4512) which stated: "The second highest accident frequency location, Alewife Brook Parkway and Route 2 Rotary, experienced 66 accidents. Angle/cross movement accidents accounted for 55 percent (36 accidents) while rear-end collisions accounted for 30 percent (20 accidents) of the accidents. This accident experience may reflect the heavy peak-hour traffic volumes, the uncontrolled nature of the traffic movements, and the existing sight distance constraints (page IV-A-29)."

The data source for this intersection accident analysis was the MDPW files for the period January 1980 through December 1981.

The MDC police accident statistics for the years 1979-1981 were analyzed for the Alewife Brook Parkway intersections from Massachusetts Avenue to Concord Avenue. During that period it was found that the Route 2 Rotary, with 55 accidents reported, was second only to Massachusetts Avenue, with 61 accidents reported. In terms of personal injuries, the Rotary was the highest accident location, with 19 personal injuries reported. The second highest location in this category was the Fresh Pond Shopping Center, with 15 reported. At the Rotary, angle collisions were most frequent (25 accidents), followed by rear-end collisions (14 accidents).

A-23 Comment: "Because of the public concern over safety and over pressures to increase lane widths, vehicle speeds, and add new traffic signals, the Final EIR should discuss the safety issue as it applies to the interim access alternatives, and the general philosophy of dealing with high-speed Route 2 traffic coming down Belmont Hill which must effect a transition safely down to a 30-MPH MDC Parkway having narrow lanes, pedestrians and urban activity. The accident analysis should look at recent trends in the area in terms of all accidents and injury accidents alone.

"The Alternative 3A/4 intersection design at the Route 2 rotary presents special problems for safety analysis. Accidents would tend to be increasingly angle collisions, rather than side-swipe collisions typical of rotaries. Furthermore, access from the Grace parcel to the new ramp is shown, and the potential for wrong-way traffic in the intersection and illegal left turns from Grace to inbound Alewife Brook Parkway should be considered.

"From standpoints of both capacity and safety, the Final EIR requires a substantially improved discussion of how the Route 2 rotary functions. The traditional view, that it is both inefficient and unsafe, cannot be accepted without closer examination...Each intersection in the study area should be assessed for the volume, adequate and safety of pedestrian crossing movements."

Response: Safety issues were not addressed in more detail for the following reasons:

1) The EOEA Scope for the DEIR stated that "This project is one of several in the Alewife vicinity, and builds on the analysis provided in previous EIRs. In particular, the recent Final EIR for the Alewife Triangle (Spaulding and Slye project) is very relevant, because the scope called for consideration of impacts and access alternatives for the near term condition, prior to the completion of the Mass DPW major roadways project."

The Spaulding and Slye DEIR devoted six pages to an accident analysis including a Roadway Link Accident summary (Table CIV-A-3), an Intersection Accident Summary (Table CIV-A-4) and an Accident Location Map (Figure IV-A-4). Replication of that analysis did not appear warranted.

2) The only specific reference to safety in the EOEA Scope concerned the additional signalized intersection on Route 2 proposed under some of the alternatives. Safety considerations were a principal cause of the elimination, by the Alewife Transportation Advisory Committee, of those alternatives from further consideration.

3) The problem of dealing with the transition of Route 2 from a high-speed expressway to a narrow-lane parkway is the major issue being addressed by the MDPW as it develops its plans for the permanent Route 2 improvements.

Other project elements involving a discussion of safety issues in the FEIR are the redesign of the Route 2-Alewife Brook Parkway rotary and the provision of pathways for pedestrians and bicycles.

A-24 Comment: "Improved pedestrian access must also be shown on the interim plans, both for access to Acorn Park and to East Arlington."

Response: Plans for improved pedestrian and bicyclist access to Acorn Park and East Arlington, as well as to the MDC Reservation, are described in Section III-C: Provisions for Pedestrian and Bicycles.

A-25 Comment: "Several of the alternatives include an allowance for the reinstallation of the single commuter rail track along the old Bedford/ Lexington route. The current tunnel design includes provision for a single track atop the new tunnel with new roadways located immediately to the west. Will a new bridge structure be required, with additional impacts on Little River? What is the anticipated usage of the track? If usage is limited, could the tracks be included within the roadway structure, rather than on a separate structure and right-of-way?

"On page 105, reference is made to the MDC restoring rail track in Lexington. Please explain."

Response: The reference to the MDC in Lexington was inadvertently left in, from an early draft of the DEIS. It should be deleted as being irrelevant to the Alewife project.

The determination of the usage of the Lexington Branch track is beyond the scope of this project. Provision for its reinstallation is made because the MBTA is required by court order to do so. A separate study of the prospective future uses of that right-of-way is now being undertaken by the MBTA.

A-26 Comment: "Will the construction of ramps over the MBTA tunnel require special approvals from UMTA or other Federal officials? Allowance should be made for contract negotiations, UMTA processing, 404 permits, legislative action, etc. It would appear that construction would begin at the earliest in late 1985 and be completed by late 1986. Is this conclusion unduly unrealistic or pessimistic?"

Response: The need for UMTA approval is being reviewed by that agency. Completion by late 1986 is a pessimistic estimate. Estimating a late 1985 opening of the interim ramps included time allowed for obtaining a 404 Permit and Orders of Condition from the Arlington and Cambridge Conservation Commissions.

A-27 Comment: "I note the absence of comments from the Massachusetts Department of Public Works. Written responses from the MDPW should be requested and obtained for the FEIR. Comments from the MDC should also be sought."

Response: Comments from the MDPW and MDC were requested. Their responses are included as Section VII-B and VII-C respectively.

B. ENVIRONMENTAL PROTECTION AGENCY

B-1 Comments: "The MBTA must provide equal compensatory water storage volume for the displaced flood storage area in order to avoid creating additional flooding problems."

"According to the findings of fact from the MBTA's Department of the Army permit for the tailtrack (February 1982 Permit #MA-LEXI-82-031) while the project has disturbed 1.7 acres of wetland, only .25 acres would be permanently lost due to sewer line construction. The other disturbed wetlands are to be restored, resulting in improved wetland quality.

"The restoration of these 1.5 acres of wetlands however may be delayed and possibly jeopardized because of the Interim Access roadway project, and the ultimate permanent roadway design. A road cutting through these wetlands (Alternatives 1, 2, and 4) along the Lexington Branch Railroad would not be as preferable from a habitat point of view compared to Alternative 3a which would follow the temporary haul road along Yates Pond.

Whichever alignment is chosen (based on traffic flow needs, environmental impacts, costs, etc...) should be designed to minimize impacts to the wetlands. Roadway alternative should utilize viaduct structures to reduce impacts on the wetlands and their flood storage capacity. Details of the impacts to the wetlands both temporary (construction staging areas) and permanent (roadway alignment fill and viaduct) should be provided in a final report, showing filling requirements for length and width of the roadway, viaduct structures, etc..."

"Unavoidable impacts (loss of wetlands) should be mitigated for by creating an equal amount of wetlands in adjacent upland areas. The section on measures to mitigate impacts should be expanded to include erosion and turbidity control plans for the construction sites, details of retaining walls proposed adjacent to Yates Pond, viaduct structures proposed for the roadways, and compensatory water storage and wetland areas. This section must be in sufficient detail to determine the practicality of providing for the necessary mitigation. The cost of mitigation should be included in the overall project cost for comparison of each of the alternatives."

Response: To address these concerns the FEIR has been organized with separate sections on the description of the preferred alternative (Section III) compensatory flood water storage (Section IV-D), replacement of wetlands (Section IV-C) and construction staging controls (Section IV-G).

C. DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

C-1 Comment: "Our review indicates minor problems exist in the air analysis worksheets. The noted problems have already been discussed with the consultant. As a result, all worksheets will be checked for errors, corrected as necessary, and included in the final."

"Since these errors will affect the results as presented in Table VII-3 of the report, DEQE will delay its review and comment until all corrections have been completed."

Response: The revised worksheets are attached as Appendix F. The DEIS Table VII-3 should read as follows:

TABLE VII-3

PREDICTED MAXIMUM CO CONCENTRATIONS
PLUS BACKGROUND AT
FOUR PROJECT AREA INTERSECTIONS (PPM)

Receptor Number	Case 1 1984 Existing 1-Hour	Case 1 1984 Existing 8-Hour	Case 2 1987 No Build 1-Hour	Case 2 1987 No Build 8-Hour	Case 3 1987 Alt. 1/2 1-Hour	Case 3 1987 Alt. 1/2 8-Hour	Case 4 1987 Alt. 3a/4 1-Hour	Case 4 1987 Alt. 3a/4 8-Hour
1	25.3	5.3	20.2	4.5	30.9	5.4	20.2	4.4
2	13.3*	2.9	16.2*	3.3	9.9*	2.4	14.6	2.6
3	70.1	7.0	43.3*	4.8	33.1	4.7	34.0	4.8
4	10.0	1.9	20.5	2.7	17.1	2.5	16.3	2.4

* Scaled from 8-hour concentrations (see text of DEIS).

Note = Values that are underlined exceed the NAAQS.

Although not commented on by the DEQE, it should be noted that the footnotes on Page 94 of the DEIS were incorrectly referenced. In the first paragraph of Section 5, Sensitive Receptors, "EPA Guidelines 1/" should read "EPA Guidelines 2/" and "DEQE 2/" should read "DEQE 3/".

The foot notes should read:

1/ "Draft EIR, Arlington Office Park, EOEA #4167", May 1982, Pages IV-B-15 and 16.

2/ EPA, Guidelines for Air Quality Maintenance Planning and Analysis Volume 9, (Revised): Evaluating Indirect sources, Second Printing, EPA-450-/4-78-001, Research Triangle Park, NC, September, 1978.

3/ Personal Communication, Ms. Heidi O'Brien, Division of Air Quality Control, DEQE, Boston, MA, March 26, 1984.

D. METROPOLITAN AREA PLANNING COUNCIL

D-1 Comment: "If the interim improvements were in place for ten years, the capacity analysis for 1987 may be optimistic. The EIR should consider the situation in 1992 or 1994. The analysis does not include Alewife Boulevard and the extensive development expected within the next ten years. The "Alewife Local Roadway Improvements" final EIR (April 1984) shows 3,431,000 square feet of office space, as compared with 1,490,000 square feet shown in Table VI A. Most of the development is in the quadrangle and represents a potentially significant traffic impact."

"Given the potential for very heavy traffic over the interim access system, the interim facilities should offer the highest practicable level of capacity. Maximum use of non-structural alternatives should be planned to supplement constructed improvements."

Response: Recognizing the long term inadequacy of the interim access roads to cope with projected future traffic volumes, a major consideration of the interim access design is to allow the permanent roadway improvements to occur as expeditiously as possible while the interim access continues in use.

Incorporating transportation systems management techniques in the interim solution is addressed in Section III-K.

D-2 Comment: "Safety, as well as capacity should be a primary concern, yet the EIR does not address the safety impacts of any of the alternatives. The EIR should address improved safety at the Dewey/Almy Circle, adverse impacts at signals on Route 2 for the access roads proposed under alternatives 1 and 2, and the continuing hazard posed by the narrowing of Route 2 to 4 lanes near Lake Street."

Response: Refinements in the design for the signalized Parkway intersection replacing the rotary address safety issues as well as capacity, by reducing short weaves, improving control over traffic movements and points of conflict, and the like. A principal reason for eliminating alternatives 1 and 2 was the safety concerns related to the additional signalized intersection that would be required on Route 2. Other safety issues related to Route 2 are to be addressed in the permanent Route 2 improvements EIS.

D-3 Comment: "The EIR does not sufficiently address bicycle and pedestrian access to the station...Alternatives 3a and 4 require access under the Parkway from the W. R. Grace area to the north end of the station, Yates Pond and the reservation. Consideration should be given to providing a pedestrian and bicycle facility at this location as access to both the station and the reservation...The EIR should include plans for some pedestrian and bicycle access in the short term. But it is equally important to identify possibilities for the long term, in order to keep these options open."

Response: A separate section, III-D, describes the provisions for pedestrians and bicycles in the preferred alternative.

D-4 Comment: "The final EIR must address the question of compensatory storage more fully, including:

- the location and extent of proposed compensatory storage.
- the adequacy of bridge spans, culverts and the channel itself for carrying the 100 year flood.
- the effect on runoff of the proposed transportation improvements both individually and in conjunction with new development in the area.

"In addition, improvements to existing channel conditions may be possible through dredging and cleaning, and incorporating the spoil in embankment fill if the material is suitable."

Response: The location and extent of proposed compensatory storage is described in Section IV-D. The remaining concerns listed are addressed in Section IV-E - Other Hydrological Controls.

D-5 Comment: "(T)he improvements should:

- have an aesthetic treatment consistent with the rustic parkland quality of the reservation.
- provide adequate spans and grades to permit pedestrian access in comfortable (not tunnel-like) surroundings.
- minimize noise impacts due to traffic through adequate grade separations and baffles to insulate the Reservation at a lower level.
- provide lighting consistent with open space areas: achieving adequate roadway illumination through closer spacing, preferably using luminaries and standards consistent with an open space design. High mast lighting should be avoided.

"In addition, the improvements should not prejudice the maintenance and improvement of the parkway to parkway standards south of the Dewey and Almy area. The MAPC open space study, when complete, will offer several recommendations on specific mitigating measures. Design of the interim access should attempt to incorporate these recommendations."

Response: The issues raised are discussed at several points in Sections III and IV. The interim access preferred alternative appears fully compatible with the proposals of the open space study as they have been developed to date.

E. ARLINGTON CONSERVATION COMMISSION

E-1 Comment: "The Draft EIR is insufficient in its scope and, therefore, unacceptable in its present content. The alternatives listed are biased towards preconceived solutions on the part of E.O.T. and M.D.P.W. and the M.B.T.A. No serious analysis appears to do justice to all alternatives listed. It would seem that those alternatives which the proponents do not wish to discuss are dismissed with the wave of a hand."

Response: The alternatives have been developed in an open process by the Alewife Transportation Advisory Committee. The Secretary of Environment Affairs has certified that the DEIR "does adequately and properly comply with the Massachusetts General Laws, Chapter 30, Section 62-62H inclusive, and the regulations implementing MEPA".

E-2 Comment: "The alternatives suggested in no way account for replacement of destroyed wetlands as required by the Wetlands Protection Act."

Response: The replacement of wetlands is described in Section IV-C - Replacement of Wetlands.

E-3 Comment: "The Commonwealth of Massachusetts is currently undergoing a water-pollution control project at Spy Pond and this fact should be included in the hydrology/planning stages of all the concurrent projects because of their impact on this important resource."

Response: A new Section IV-E - Other Hydrological Controls has been added. No relationship between the hydrological controls being imposed as part of the Interim Access project and the water pollution controls being considered for Spy Pond has been identified.

E-4 Comment: "A full study of the "no-build" alternative, including traffic management techniques, should be aggressively investigated."

Response: Further analysis of traffic systems management techniques as part of a No Build option is described in Appendix G - Monograph on the Application of Transportation Systems Management Measures.

E-5 Comment: "Throughout the Draft EIR, statistics relating to traffic continually refer to 1987 figures. It seems curious, to say the least, that such figures are used to illustrate a garage/opening impact in 1985. It would seem that more appropriate statistics are necessary."

Response: While the garage would open in 1985, the garage traffic would take some time to build up to a normal traffic volume operation. In its September 23, 1983 Certificate letter the EOEA specifically requested that the year 1987 be used. It was determined to be the relevant analysis year by EOEA because it was two years after the scheduled garage opening and because it represented the best projection of the mid-point of operation of the interim roadway given the likely projected year of 1990 for the beginning of construction of portions of the longer-range highway improvements being studied in the Route 2 EIS.

E-6 Comment: "Given a short-term of ten years, when will said destroyed wetlands be replaced and, given unknown funding, at what quality level? The M.B.T.A., in its agreement with the Town of Arlington re the tailtrack extension project, promised to restore destroyed wetlands when the tailtracks were finished. Proposed alternatives negate these promises."

Response: The wetlands impacted by the tail tracks in Arlington will be restored per agreement. The Interim Access project will delay replacement of wetlands south of Route 2. Upon completion of the roadway construction, these wetlands will be restored.

E-7 Comment: "Section V of the Draft EIR provides two sentences only for the discussion of the protection of wildlife. Why is the effort on such an important issue so superficial? The protection of migratory birds and their habitat is under the jurisdiction of the F.B.I. Its priority is within the top ten of a list of twenty-five (25) mandates. Has anyone investigated these guidelines?"

Response: According to the Federal Fish and Wildlife Service, the protection of migratory birds and their habitat is under its jurisdiction.

A further discussion of wildlife and its habitat is contained in Section IV-F - Treatment of Open Space.

F. BELMONT CONSERVATION COMMISSION

F-1 Comment: "2. The report indicates the wetlands impact and compensatory storage requirements for the alternatives considered. However, the report does not indicate how and where the replacement for the loss of wetlands and compensatory storage will occur. The final report should present details for replacement of wetlands and compensatory storage."

Response: The detailed proposals for the location, size and configuration of the wetlands replacement area and compensatory storage area are shown in Sections IV-C and IV-D respectively.

F-2 Comment: "3. The draft report does not address retention systems to mitigate effects of increased runoff from paved or covered areas. The final report should address these issues and the design should provide for retention systems or other measures to mitigate increased runoff."

Response: Discussion of the control of runoff from the proposed roadways is included in Section IV-E - Other Hydrological Controls.

G. CAMBRIDGE CONSERVATION COMMISSION

G-1 Comment: "The wetlands to be affected by the various alternatives are incompletely described. No information is provided on the value of these wetlands, and the stress that they are now undergoing due to the cumulative impacts of other projects in the area."

Response: A more complete description of the wetlands affected by the preferred alternative and more information on their value are included in Section III - Description of the Preferred Alternative.

G-2 Comment: "Although the DEIR states the maximum wetlands loss would be 3200 square feet, there is no information to support that conclusion."

Response: This information is provided in Section III.

G-3 Comment: "The effects of each alternative on wetlands and floodplains are described only in very general terms by indicating the numbers of square feet of wetland or cubic feet of flood storage to be lost."

Response: The effects of the preferred alternative on wetlands and flood plains are described in Section III.

G-4 Comment: "Throughout the DEIR, there is an unsupported assumption that the losses of wetlands and flood storage capacity can be mitigated for all alternatives; however, there is no specific information as to how this will be accomplished, and where. For instance, on page 97, the DEIR states that wetlands impacts of Alternatives 1, 3A and 4 could be mitigated by "replacing the wetlands within the Alewife Reservation". What wetlands are referred to here, and what is meant by replacement is not clear."

Response: This issue is addressed in Sections IV-C - Replacement of Wetlands and in Section IV-D - Compensatory Flood Water Storage.

G-5 Comment: "Compensatory storage volume of up to 223,000 cubic feet may be required depending on the alternative, yet no explanation is given as to how it will be accomplished other than to state that the abandoned freight cut-off right-of-way or other MBTA owned areas will be used."

Response: The detailed proposals for providing for compensatory storage are described in Section IV-D - Compensatory Flood Water Storage.

G-6 Comment: "The DEIR does not describe in any detail how construction impacts, such as erosion and sedimentation, will be mitigated, nor does it explain how or whether affected areas will be restored after the short-term access road is removed. We believe it is important for these issues to be addressed in the FEIR rather than deferred given the MBTA's poor record in protecting wetland resources during the construction of the garage."

Response: A section has been included to address these concerns: Section IV-G - Construction Staging Controls.

G-7 Comment: "The DEIR describes the wetlands on the W. R. Grace property as being not sensitive or valuable but does not provide any information to support this conclusion."

Response: The only wetlands permanently impacted by the preferred alternative is a 3,200 square foot segment of the wetlands lying between the Parkway and the W. R. Grace property. This wetlands area now contains mostly trash and dumped waste with little useful vegetation.

H. CAMBRIDGE COMMUNITY DEVELOPMENT DEPARTMENT

H-1 Comment: "The non-structural alternatives presented in the report, i.e. traffic management techniques, etc., should be implemented in addition to, not in place of a build solution. Although the implementation of Alternative 4 will alleviate much of the traffic impacts in the area, it will not be enough. It seems prudent, in light of the projected future development at Alewife, that these programs be started now."

Response: It is proposed that some traffic management techniques be implemented in addition to the construction of the preferred alternative. These are described in Section III-K - Supplementary Transportation Systems Management Actions.

H-2 Comment: "Little mention was made of pedestrian and bicycle access in the implementation of the interim solution. Such access accommodations should not wait for the permanent improvements, but should be provided during this interim construction."

Response: Section III-D - Provisions for Pedestrians and Bicycles describe the facilities proposed for implementation during the interim period.

H-3 Comment: "In the report's discussion of wetlands and flooding (page 97) the second paragraph states that the location of the compensatory storage area will utilize the abandoned Freight Cut-Off Railroad right-of-way lying west of its junctions with the Lexington Branch right-of-way as much as possible. The goal is to utilize all areas for compensatory storage that are currently in MBTA ownership.

"Is there enough storage capacity in these areas?

"If not, what other areas are under consideration?

"Would the Freight Cut-Off right-of-way still be available for bicycle/pedestrian connections to Blanchard Road in Belmont?

"The Freight Cut-Off right-of-way is a raised berm which acts as protection for the Alewife Triangle from flooding of the Little River as can be seen from Figure V-D (1955 Storm of Record) found on page 55. If this berm were removed, what would be the impact on flooding in the Alewife Triangle?

"The final EIR should explore more creative methods of providing compensatory storage. Alternative methods might include the creation of public amenities such as the Alewife Canal proposed in the Alewife Revitalization Plan. Such an alternative would obviously be more desirable and attractive than those proposed in the Draft EIR."

Response: These issues are addressed in Section IV - Measures to Mitigate Impacts.

H-4 Comment: "In the report's discussion of carpool parking fees (page 99) the third paragraph states that "It would appear then that the price sensitivity to carpooling is somewhat low for the range of parking fees apt to be charged at Alewife and that special or discounted carpool fees are not a relevant pricing strategy at this time.

"This fact may be true given the current low parking fees charged by the MBTA at its existing parking facilities. Would it still be true if the fee for single occupancy vehicles were raised to $5.00 per day or higher?"

Response: An issue of garage pricing strategy is considered in Appendix G - Monograph on the Application of Transportation Systems Management Measures.

H-5 Comments: "On page 22, Table II-1, the 1987 Traffic Impact in Predominant Direction should reference Figures VI-J and VI-K, not Figures VI-F and VI-G.

"On page 78, Table VI-D, the 1987 Build V/C for Alewife at Rindge under Alternative 4 should be 1.66, not 1.25.

"On page 79, Table VI-E the 1987 Build V/C for Alewife at Route 2 rotary under Alternative 4 should be 1.11, not 1.0."

Response: The detailed traffic analysis containing revisions is included in the FEIR as Appendix D.

I. MYSTIC RIVER WATERSHED ASSOCIATION

I-1 Comment: "The five alternatives selected include the No Build, but fail to mention its management options. As a consequence, the Table II-A (page 22) only shows the No Build data without any management techniques applied. The reader is deprived of the comparative information which he needs.

"The three following paragraphs suffer from the same omission. There is no mention of a 1987 scenario with one or several of the techniques applied."

Response: The application of TSM measures is discussed in detail in Appendix G-Monograph on the Application of Transportation System Management Measures.

I-2 Comment: "It should be remembered that the objective of the DEIR is to address the problem of garage opening next year. Except for one or two developments, e.g., Spaulding's Building #1, it seems doubtful that major buildings will be occupied by 1987. It seems essential for the table to include the traffic situation at opening time, i.e., next spring."

Response: The use of 1987 as the forecast year was directed by the EOEA in the scoping process. The development forecasts are realistic because it is appropriate to look at the Interim Access Roadway operations at the mid-point of its duration.

The objective of the Interim Access improvements is not specifically focused on the garage opening but on the operation of the entire transit facility between the opening date and the completion of the MDPW permanent roadway improvement project.

I-3 Comment: "The DEIR does not respond to the EOEA Certificate of October 24, 1983, DEIR page 19, third paragraph, which asks

"(a) that the No Build should be studied in light of prior MBTA conclusions that existing access would suffice.

"(b) whether phased openings of the garage, with careful monitoring of traffic conditions is a reasonable planning strategy, and

"(c) that a separate section should indicate the relationship to other projects including the long-range DPW project which still lacks a final alternative."

Response: The FEIR reviews the studies made of the No-Build and other alternatives and concludes that the Interim Access roads proposed in the Preferred Alternative are required if the station is to function effectively.

The monitoring of traffic conditions proposed during the first few months following the garage opening is described in Appendix G and in Section III-K on the FEIS.

The relationship with other projects was described in a separate section of the DEIR (Section IX).

I-4 Comment: "Mention of indirect and staging impacts should be made." (on wetlands, parklands and flooding)."

Response: Discussion of these impacts can be found in Sections III and IV.

I-5 Comment: "The skepticism of the DEIR does not seem to jibe with the reports of the Caravan, Inc., a non-profit corporation funded by MPO. The DEIR should have given a more comprehensive description of the overall Wellington conditions. The DEIR's conclusion that special treatment of carpools destined for transit stations is not relevant, is not immediately clear. It is tailor-made for Alewife, in the opinion of several Alewife developers."

Response: Support for the expanded use of the resources Caravan, Inc. is expressed in Section III-K and in Appendix G. An extensive discussion of a greater dependence on high occupancy vehicles is also contained in Appendix G.

I-6 Comment: "Staged Opening: the DEIR describes an improbable scenario. If one would open only half of the garage, one would monitor the effect and proceed according to observations of the factual impact. There are other techniques available to the garage manager. The MBTA has proposed itself in 1982 that it would open the garage slowly and in steps and monitor the results. That easy opportunity is one of the pertinent advantages of TSMT's over interim access structures.

"The wholesale conclusions of the second paragraph that garage access and egress restrictions during certain hours would hurt transit usage and income, garage revenue, traffic diversions and LOS, and that 20 percent of the expected modal shift would be lost are not convincing."

Response: Section III-K and Appendix G include proposals for monitoring traffic during the garage opening stages and for introducing TSM controls. The TSM controls are proposed to maximize transit ridership and are not designed to prevent the garage from being fully utilized as soon as possible. An HOV is preferred to an LOV because it produces more riders. Similarly, an LOV is preferred to an empty garage space for the same reason.

J. WINN BROOK ASSOCIATION

J-1 Comment: "It does not appear that certain questions in the scope have been answered in the draft. They concern the dubious assumptions that existing access would suffice for the Alewife station."

Response: The FEIR responds more fully to the questions in the scope concerning the adequacy of existing access. The FEIR states that the Interim Access roads proposed in the Preferred Alternative are required if the station is to function effectively.

J-2 Comment: "What would be the capacity during the PM Peak Hour in 1987 for the Alternate 4 exit road at the signalized intersection at Alewife Brook Parkway and Route 2? What is the storage capacity of this exit road from the garage to the intersection? What is the traffic volume forecast for the Grace development's contribution to this road?...for ADL?"

Response: For the Preferred Alternative, the v/c ratio is 1.03 at the signalized intersection of Alewife Brook Parkway and Route 2.

The outbound access roadway is over 1,300 feet long which could store some 85 vehicles per lane or about 170 vehicles in total back to the garage.

On the outbound access roadway in the PM peak hour, the Grace development is expected to generate about 160 vehicles while the ADL volume is expected to be in the 80 to 100 vehicle range.

J-3 Comment: "Does not the Federal Highway Administration under CFR 23, L-3771.105 or MEPA under 301 CMR 10.10 have a responsibility to demand comprehensive environmental planning? One of a dozen pertinent questions pointing up a lack of coordinated planning is: If the Alternate 4 exit road develops a Level of Service F, and Alewife Boulevard is built, will not a high volume of PM Peak Hour traffic exit via Smith Place and Concord Avenue to add to the westbound traffic that is already flooding the Winn Brook neighborhood of Belmont?"

Response: The Alewife Interim Access project is a state and not an FHWA project. Analysis of the Alewife Boulevard project is beyond the scope of this project. A final EIR has recently been completed on the Alewife Boulevard project.

K. ARTHUR D. LITTLE, INC.

K-1 Comment: "We would like to suggest one modification to Alternate Number 4; namely, a connection at the merge point of the eastbound and westbound access road at the western corner of the garage. This would provide an opportunity to reverse direction using those two ramps."

Response: In the description of the preferred alternatives inbound and outbound ramps (Sections III A and III B) and related plans, it can be noted that the recommended connection between the two roadways has been incorporated.

L. MUGAR/FINARD ASSOCIATES

L-1 Comment: "Given the fact that project development of the Mugar/Finard parcel enjoys local official support, has satisfied the state environmental process, the Arlington Redevelopment Board, the Arlington Zoning Board of Appeals and the state Department of Environmental Quality Engineering, and, as such, is a real project in contrast to a number of proposed area developments that have been considered in the analysis, it is imperative that the Final EIR address and assess the compatibility of Mugar/Finard site access with the as yet to be determined preferred interim station access plan, particularly in view of the uncertainty of future long-term improvements to Route 2. Otherwise, the identification and analysis of environmental impacts associated with the interim access station plan will fall short of being comprehensive."

Response: No incompatibility between the interim access project and the proposed Arlington Office Park has been identified.

M. ELSIE C. FIORE

M-1 Comment: "Preservation of the MDC Alewife Reservation should be of paramount importance in this area. If construction and development cannot be carried out with no harm to this delicate area, it should not be allowed."

Response: Plans for the replacement of the wetlands disturbed are described in Section IV-C - Replacement of Wetlands. Other mitigating measures designed to minimize impact on the Reservation are described in Section IV.

M-2 Comment: "Although it has been said that the interim access could be part of the detoured roadways used during the permanent reconstruction of Route 2, these plans are not shown. Also, even though Alternatives 1 and 2 claim to be within the right-of-way of both the MBTA and the DPW, MDC land must be used for staging purposes. Plans for this staging should be given."

Response: The use of the garage ramps as detour routes during the permanent reconstruction of Route 2 depends on the nature of the plans for that reconstruction. There has been close coordination between the two projects to insure that the Interim Access does not impede the long-term solution. There will need to be some detouring with nearly all the Route 2 improvement schemes being evaluated. There is a strong likelihood that the Interim Access roads could be used for this purpose, although until the Route 2 EIS process is completed, plans for detours are subject to change.

The construction easements required from the MDC are described in Section III-E.

M-3 Comment: "Since the MBTA garage is designed to hold only 2,000 cars, how will the diversion of the additional 5,700 automobile trips be accomplished?"

Response: The reference to 7,700 automobile trips being diverted to transit was for the entire Red Line Northwest Extension. The Alewife Station would cause an estimated 5,200 diverted trips (See p. 65 of the DEIS). Each long-term use of a garage space accounts for two trips daily. For each space used by short term parkers in which a turnover occurs each space accounts for at least four trips daily. Each kiss-and-ride drop-off accounts for two trips, and each kiss-and-ride pick-up accounts for two trips daily. The 5,200 figure is the estimated sum of all these trips.

N. ROBERT J. LA TREMOUILLE

N-1 Comment: "Particularly distressing is the MBTA failure to provide the no-build option the level of importance which it deserves and which was directed by the secretary."

Response: The Secretary of Environment Affairs has certified that the DEIR "does adequately and properly comply with the Massachusetts General Laws, Chapter 30, Section 62-62H inclusive, and the regulations implementing MEPA". Further discussion of the no-build option is included in the FEIR.

VI CIRCULATION LIST

Copies of this Final Environmental Impact Report have been transmitted to the following agencies, groups and individuals. Additional copies may be obtained by request from Sverdrup & Parcel and Associates, Inc. at 38 Chauncy Street, Boston, Massachusetts, 02111, (617) 482-7880.

Secretary James S. Hoyte
E.O.E.A.
100 Cambridge Street, 20th Floor
Boston, MA 02202
ATTN: MEPA Unit
EOEA #4931

Secretary Frederick P. Salvucci
EOTC
10 Park Plaza
Boston, MA 02116

Mr. Kennedy Hagg, Director
Ms. Heidi O'Brien
DEQE
Division of Air Quality Control
One Winter Street
Boston, MA 02108

Mr. Robert Horigan
MDPW
Environmental Section
100 Nashua Street
Boston, MA 02114

Division of Air and Hazardous Materials
Mobile Source Planning Branch
One Winter Street
Boston, MA 02108

Mr. Charles F. Mistretta, D.H.E.
MDPW
District 4
100 Nashua Street
Boston, MA 02114

Mr. Edward J. Cox, D.H.E.
MDPW
District 8
400 D Street
South Boston, MA 02114

Ms. Julia O'Brien
Metropolitan District Commission
20 Somerset Street
Boston, MA 02108

D.E.Q.E.
323 New Boston Street
Woburn, MA 01801

Mr. Alex Zaleski
MAPC
110 Tremont Street
Boston, MA 02108

Secretary Amy S. Anthony
E.O.C.D.
100 Cambridge Street, 14th Floor
Boston, MA 02202

State Clearinghouse
One Ashburton Place
Boston, MA 02108

Massachusetts Department of Community Affairs
One Ashburton Place
Boston, MA 02108

Ms. Valerie Talmadge
Massachusetts Historical Commission
294 Washington Street
Boston, MA 02108

Mr. Bob Yaro
Office of Planning
Department of Env. Management
100 Cambridge Street, Room 1903
Boston, MA 02202

Mr. Richard Easler
Community Development
57 Inman Street
Cambridge, MA 02139

Mr. Paul Healy
City Clerk Office
795 Massachusetts Avenue
Cambridge, MA 02139

North Cambridge Public Library
70 Rindge Avenue
Cambridge, MA 02140
ATTN: Branch Librarian

Mr. Alan McClennen, Director
Department of Community
Development and Planning
Arlington, MA 02174

Mr. Herbert Meyer
Mystic River Watershed Association
276 Massachusetts Avenue
Arlington, MA 02174

Mr. Charles Lyons
Board of Selectmen
730 Massachusetts Avenue
Arlington, MA 02174

Mr. Stephen Gilligan, Chairman
Arlington Conservation Commission
P. O. Box 128
Arlington, MA 02174

Ms. Christine M. Callahan
Town Office Clerk
730 Massachusetts Avenue
Arlington, MA 02174

Ms. Judith A. Quimby
East Arlington Citizen's Association
12 Edgarton Road
Arlington, MA 02174

Robbins Library
Town of Arlington
700 Massachusetts Avenue
Arlington, MA 02174
ATTN: Town Librarian

Mr. William P. Monahan, Chairman
Board of Selectmen
455 Concord Avenue
Belmont, MA 02178

Mr. Thomas Callaghan
Winn Brook Association
17 Eliot Street
Belmont, MA 02178

Mr. James Livingston
Planning Board
Town of Belmont
90 Agassiz Avenue
Belmont, MA 02178

Belmont Library
366 Concord Avenue
Belmont, MA 02178
ATTN: Town Librarian

Mr. Reid D. Weedon, Jr.
Senior Vice President
Arthur D. Little, Inc.
25 Acorn Park
Cambridge, MA 02140

Rep. Mary Jane Gibson
State House, Room 446
Boston, MA 02133

Mr. Albert Wilson
Alewife Businessmen Association
c/o A. O. Wilson Structural Company
40 Smith Place
Cambridge, MA 02138

Mr. A. T. Sawyer
Neighborhood Number 9 Association
14 Avon Place
Cambridge, MA 02138

Mr. Thomas Anninger
Neighborhood Number 10 Association
26 Healy Street
Cambridge, MA 02138

Ms. Carolyn Mieth
Neighborhood Number 11 Association
North Cambridge Citizens Group
15 Brookford Street
Cambridge, MA 02140

Mr. Richard Cahill
Neighborhood Number 12 Association
27 Normandy Terrace
Cambridge, MA 02138

Mr. Richard Teso
Director of Traffic and Parking
City of Cambridge
City Hall Annex
57 Inman Street
Cambridge, MA 02139

Mr. Joseph P. Carabello, Jr.
156 Lake Street
Arlington, MA 02174

Ms. Elsie C. Fiore
58 Mott Street
Arlington, MA 02174

Mr. Richard Sheridan
235 Channing Road
Belmont, MA 02178

Mr. Marvin Miller
Barnes and Jarnis
61 Batterymarch Street
Boston, MA 02110

Mr. Frank E. Baxter
18 Sunset Drive
Burlington, MA 01803

Mrs. Linda F. Jonash
EOTC
10 Park Plaza
Boston, MA 02116

Mr. Matt Coogan
EOTC
10 Park Plaza
Boston, MA 02116

Mr. Sam Altreuter
Spaulding and Slye
15 New England Executive Park
Burlington, MA 01803

Mr. Michael McCarthy
Arthur D. Little, Inc.
Acorn Park
Cambridge, MA 02140

Mr. David Vickery
Hines Industrial
27 State Street
Boston, MA 02109

Mr. Walter Gustofson
MDPW
100 Nashua Street
Boston, MA 02114

Senator Richard Kraus
State House, Room 511
Boston, MA 02133

Ms. Carol M. Sonduck
League of Women Voters
320 Park Avenue
Arlington, MA 02174

Ms. Pam Thomure
Cambridge Transportation Forum
97A 6th Street
Cambridge, MA 02141

Mr. Michael Hunter
Governor's Office of Economic
Development
State House, Room 109
Boston, MA 02133

Ms. Janet Burns
Cambridge Conservation Commission
57 Inman Street
Cambridge, MA 02139

Mr. Robert O'Shaughnessy
Belmont Conservation Commission
Town Hall
Belmont, MA 02176

Mr. Barry Faulkner
Cambridge Systematics
238 Main Street, Room 310
Cambridge, MA 02142

Ms. Sally Sabo
2 Radcliffe Road
Belmont, MA 02178

Sen. George Bachrach
State House, Room 405
Boston, MA 02133

Rep. Charles Flaherty
State House, Room 33
Boston, MA 02133

Mr. George O'Malley
Mugar Communications
Government Center
1 Bullfinch Place
Boston, MA 02114

Mr. Ralph Atkinson
Corps of Engineers
424 Trapelo Road
Waltham, MA 02154

Mr. Rodney Plourde
Fay, Spofford & Thorndike
171 Spring Street
Lexington, MA 02173

Mr. Robert Vanasse
Vanasse/Hangen Associates, Inc.
184 High Street
Boston, MA 02110

Dr. Joel Douglas
70 Trapelo Road
Belmont, MA 02178

Mr. Eric Anderson
34 Hamilton Road
Arlington, MA 02174

Mr. Stewart Sanders
73 Fairmont Street
Belmont, MA 02178

Ms. Judith Pickett
Bramberg & Hameda
29 Commonwealth Avenue
Boston, MA 02116

Mr. Leslie Moore
Ellenzweig, Moore and Associates
65 Winthrop Street
Cambridge, MA 02138

Town Clerk
455 Concord Avenue
Belmont, MA 02178

Department of Environmental
Quality Engineering
100 Cambridge Street
Boston, MA 02202

Mr. Robert J. LaTremouille
348 Franklin Street
Cambridge, MA 02139

U.S. Environmental Protection Agency
Region I
J. F. Kennedy Federal Building
Boston, MA 02203

VII CORRESPONDENCE

A. COMMENTS ON THE DEIR

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J. F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203

May 8, 1984

Samuel G. Mygatt, Director
Executive Office of Environmental Affairs
20th Floor, 100 Cambridge Street
Boston, MA 02202

Attention: MEPA Unit - EOEA No. 4931

Dear Mr. Mygatt:

We have reviewed the Draft Environmental Impact Report for the MBTA Alewife Station Interim Access project. The following comments for your consideration pertain to the wetlands impacts. We will be reviewing a Section 404 permit application for this project during the Corps of Engineers Public Notice Process.

Flooding

Most of the alternative interim access roadways have some wetland impacts for the road itself and the construction staging areas which will affect flood storage areas. The MBTA must provide equal compensatory water storage volume for the displaced flood storage area in order to avoid creating additional flooding problems. This is extremely important since localized flooding in the Alewife watershed is a major concern, and the flooding problem has been aggravated by a high degree of development in the basin.

Wetlands

According to the findings of fact from the MBTAs Department of the Army permit for the tailtrack (Feb.1982 Permit # MA-LEXI-82-031) while the project has disturbed 1.7 acres of wetland, only .25 acres would be permanently lost due to sewer line construction. The other disturbed wetlands are to be restored, resulting in improved wetland quality.

The restoration of these 1.5 acres of wetlands however may be delayed and possibly jeopardized because of this interim access roadway project, and the ultimate permanant roadway design. A road cutting through these wetlands (alternatives 1, 2, and 4) along the Lexington Branch Railroad would not be as preferable from a habitat point of view compared to alternative 3A which would follow the temporary haul road along Yates Pond. Whichever alignment is chosen (based on traffic flow needs, environmental impacts, costs, etc...) should be designed to minimize impacts to the wetlands. Roadway alternatives should utilize viaduct structures to reduce impacts on the wetlands and their flood storage capacity. Details of the impacts to the wetlands both temporary (construction staging areas) and permanent (roadway alignment fill and viaduct) should be provided in a final report, showing filling requirements for length and width of the roadway, viaduct structures, etc...

Mitigation

Unavoidable impacts (loss of wetlands) should be mitigated for by creating an equal amount of wetlands in adjacent upland areas. The section on measures to mitigate impacts should be expanded to include erosion and turbidity control plans for the construction sites, details of retaining walls proposed adjacent to Yates Pond, viaduct structures proposed for the roadways, and compensatory water storage and wetland areas. This section must be in sufficient detail to determine the practicality of providing for the necessary mitigation. The cost of mitigation should be included in the overall project cost for comparison of each of the alternatives. For further coordination, please call Edward Reiner, of my staff, at 223-3911.

Sincerely yours,

William J. Butler

William J. Butler, Chief
Planning and Standards Section (WR/PS-2103)

cc: USF&W, Concord, NH
NMFS, Gloucester, MA
MADEQE, NE Region Wetlands Section
MADWPC, Boston, MA
Cambridge, MA, Conservation Commission
Mystic River Watershed Association

ANTHONY D. CORTESE, Sc.D.
Commissioner
727-5194

The Commonwealth of Massachusetts
Department of Environmental Quality Engineering
Metropolitan Boston - Northeast Region
323 New Boston Street, Woburn, MA 01801

4611

M E M O R A N D U M

TO: James S. Hoyte, Secretary
Executive Office of Environmental Affairs

ATTN: Steve Kaiser

FROM: Michael J. Maher, Section Chief

DATE: April 27, 1984

SUBJECT: MBTA Alewife Station Interim Access,
draft EIR, Arlington and Cambridge, Massachusetts

REFERENCE: EOEA #4931

This office has completed its review of the above referenced project. Our review indicates minor problems exist in the air analysis worksheets. The noted proolems have already been discussed with the consultant. As a result, all worksheets will be checked for errors, corrected as necessary, and included in the final.

Since these errors will affect the results as presented in Table VII-3 of the report, DEQE will delay its review and comment until all corrections have been completed.

Should you have questions concerning these comments please contact Heidi O'Brien (292-5623).

HOB/yw

cc: Peter Guldberg, Tech Environmental
Donald Kidston, MBTA

Metropolitan Area Planning Council

110 Tremont Street Boston, Massachusetts 02108 (617)-451-2770

Serving 101 Cities & Towns in Metropolitan Boston

May 8, 1984

The Honorable James S. Hoyte, Secretary
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, MA 02202

ATTN: MEPA Unit

RE: Proposed Interim Access to MBTA Alewife Station, Arlington and Cambridge, DEIR (MAPC #DEIR-84-21, Rec'd. 4/6/84) EOEA #4931

Dear Secretary Hoyte:

In accordance with the provisions of Chapter 30, Section 62 of the Massachusetts General Laws, the Council has reviewed the Draft Environmental Impact Report (DEIR) for the proposed Interim Access to MBTA Alewife Station, Arlington and Cambridge, and has prepared the following comments.

In designing interim access for the Alewife Station, the EIR should consider the potential life of the resulting system. If the long-term improvements are ten or even fifteen years off, it would be advisable to select the alternative which is most appropriate in that context.

Representatives from EOTC have expressed their commitment to timely completion of the permanent access EIR and construction of the ultimate access facilities and roadway improvements in the area; however, there are a number of issues concerning the permanent improvements which could delay implementation. Funding is a major concern, given the cost of the long-term improvements. The work could include the widening of Route 2 from Lake Street to the Alewife Parkway, the reconstruction of the Parkway, and the replacement of the two truss bridges over the railroad, and permanent garage access. These improvements are likely to cost in excess of $40,000,000 and, if federally funded, would probably be included in the federal consolidated primary category, taking the lion's share of the limited funds available for the entire state. Furthermore, there may be changes in state administration, or in attitudes toward the need for permanent access. Even assuming the availability of funds and continued support for permanent solutions, the time required to make such improvements may exceed ten years. Therefore, consideration should be given to the possibility that interim access may be in existence for approximately ten years.

"Relocated Lexington Branch Railroad." This right-of-way (ROW) currently has no service or track and the region's Transportation Improvement Program does not include proposed construction or service along this route. With timely planning, the state could use the ROW for The Minute Man Bikeway now while reserving the route for rail or transit use in the future with special legislation, or proclamations, as appropriate. For now, the ROW might properly be labelled "Lexington Branch Right-of-way."

There are unique opportunities for pedestrian and bicycle access at Alewife Station, and the commuting population may well be predisposed to use such facilities at a high rate. The EIR should include plans for some pedestrian and bicycle access in the short term. But it is equally important to identify possibilities for the long term, in order to keep these options open.

Wetlands

The entire Alewife area is subject to extensive flooding and is one of the few remaining areas still subject to damaging flood levels since the construction of the Amelia Earhart Dam. The lowlands in the vicinity of Little Pond and Little River consist almost entirely of wetlands or seasonally flooded lands. Two of the alternatives (including the alternative preferred by MAPC for traffic reasons) involve extensive disturbance of these wetlands and flood storage capacity. The final EIR must address the question of compensatory storage more fully, including:

- the location and extent of proposed compensatory storage
- the adequacy of bridge spans, culverts and the channel itself for carrying the 100 year flood.
- the effect on runoff of the proposed transportation improvements both individually and in conjunction with new development in the area.

In addition, improvements to existing channel conditions may be possible through dredging and cleaning, and incorporating the spoil in embankment fill if the material is suitable.

Open Space

The proposed transportation improvements lie in an area of considerable importance to regional open space. They affect an important parkway link between the Mystic and Charles River open space systems and actually occupy a portion of the Alewife Reservation, an "urban wilds" area maintained in a semi-wild state by the MDC. It now appears that vehicular access across this area will be acceptable (even desirable if it reduces the traffic impacts on the existing parkway sytem) if it meets high design standards. In particular the improvements should:

- have an aesthetic treatment consistent with the rustic parkland quality of the reservation
- provide adequate spans and grades to permit pedestrian access in comfortable (not tunnel-like) surroundings
- minimize noise impacts due to traffic through adequate grade separations and baffles to insulate the Reservation at a lower level.
- provide lighting consistent with open space areas: achieving adequate roadway illumination through closer spacing, preferably using luminaries and standards consistent with an open space design. High mast lighting should be avoided.

Capacity

If the interim inprovements were in place for ten years, the capacity analysis for 1987 may be optimistic. The EIR should consider the situation in 1992 or 1994. The analysis does not include Alewife Boulevard and the extensive development expected within the next ten years. The "Alewife Local Roadway Improvements" final EIR (April 1984) shows 3,431,000 square feet of office space, as compared with 1,490,000 square feet shown in Table VI-A. Most of the development is in the quadrangle and represents a potentially significant traffic impact.

Given the potential for very heavy traffic over the interim access system, the interim facilities should offer the highest practicable level of capacity. Maximum use of non-structural alternatives should be planned to supplement constructed improvements.

Safety

Safety, as well as capacity should be a primary concern, yet the EIR does not address the safety impacts of any of the alternatives. The EIR should address improved safety at the Dewey/Almy Circle, adverse impacts at signals on Route 2 for the access roads proposed under alternatives 1 and 2, and the continuing hazard posed by the narrowing of Route 2 to 4 lanes near Lake Street.

Bicycle and Pedestrian Access

The EIR does not sufficiently address bicycle and pedestrian access to the station. These "non-structural" services should be considered regardless of the interim access alternative. Based on population densities in the Alewife Station area, there is likely to be a high usage of such services.

Alternatives 3a and 4 require access under the Parkway from the W.R. Grace area to the north end of the station, Yates Pond and the reservation. Consideration should be given to providing a pedestrian and bicycle facility at this location as access to both the station and the reservation.

Consider the following:

1. The communities of Cambridge, Lexington and Arlington support the construction of The Minute Man Bikeway on the Lexington branch line.

2. Senator Krauss and Representative Gibson support a pedestrian linkage from East Arlington to the station.

3. Alternative 2 prevents the development of a bikeway or pedestrian facility on the Lexington branch, which could be accommodated in any of the other three alternatives. (Alternative 2 also takes the sidewalks on both sides of Route 2 for road widening).

4. The freight cut-off from Belmont to the garage offers another bicycle/pedestrian access option.

5. The proposals described in the EIR may discourage implementation of The Minute Man Bikeway, specifically in the references to the

In addition, the improvements should not prejudice the maintenance and improvement of the parkway to parkway standards south of the Dewey and Almy area. The MAPC open space study, when complete, will offer several recommendations on specific mitigating measures. Design of the interim access should attempt to incorporate these recommendations.

Recommendation

Based on our understanding of the project and impacts, we recommend that alternative 4 be implemented. This alternative, although not substantially more costly than the others in economic and environmental respects, does provide substantially higher capacity to accommodate anticipated traffic within a realistic service life.

Sincerely,

Joel B. Bard

Joel B. Bard
General Counsel/Asst. Director

JBB:CWB:jtg
cc: Richard Easler, MAPC rep., Cambridge
Alan McClennen, Jr., MAPC rep., Arlington
M. Perry Chapman, MAPC rep., Belmont
Frank E. Baxter, MAPC Secretary
Linda Jonash, Exec. Office of Transportation & Construction
Carol W. Blair, MAPC staff

TOWN OF ARLINGTON
MASSACHUSETTS

CONSERVATION COMMISSION
P O Box 128

May 2, 1984

Secretary
Executive Office of Environmental Affairs
20th Floor
100 Cambridge Street
Boston, Massachusetts 02202

RECEIVED
MAY 4 1984
OFFICE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS

Attention: MEPA UNIT

Gentlemen:

These comments are in response to the Draft EIR on the MBTA Interim Access, EOEA 4931, March, 1984. The Arlington Conservation Commission appreciates receiving the draft EIR and the opportunity to respond. The commission believes the immensity of the project, as well as surrounding developments, to be of grave importance. Therefore, we respond with the following:

1) The Draft EIR is insufficient in its scope and, therefore, unacceptable in its present content. The alternatives listed are biased towards preconceived solutions on the part of E.O.T. and M.D.P.W. and the M.B.T.A. No serious analysis appears to do justice to all alternatives listed. It would seem that those alternatives which the proponents do not wish to discuss are dismissed with the wave of a hand.

2) The continued development of the triangle area--Spaulding & Slye, W.R. Grace, A.D. Little--will not add to the parking demand at the Alewife station garage. Employees of those companies travelling from Boston or other outlying areas would utilize public transportation and, thereby, park closest to their own communities. Those employees travelling from the north and west would utilize parking facilities provided by each development (which has required minimums per City of Cambridge zoning by-laws).

3) The Arlington Conservation Commission agrees with the comments of the M.R.W.A. regarding environmental and federal issues pertaining to segmentation of concurrent projects. Not only is this poor planning, but it is also illegal according to the D.O.T. program manual 7-7-2. The alternatives suggested in no way account for replacement of destroyed wetlands as required by the Wetlands Protection Act. Compensatory storage in a floodplain does not equate to replacement/restoration of wetlands as stated by D.E.Q.E.'s Technical Division in the preface of the Regulations of the Wetlands Protection Act.

4) The recommendations of the Mystic River Comprehensive Hydrology Study have not been implemented. These recommendations should be

implemented prior to any construction in the Alewife Watershed and must be included in the planning phase before an appropriate evaluation can be made. The Commonwealth of Massachusetts is currently undergoing a water-pollution control project at Spy Pond and this fact should be included in the hydrology/planning stages of all the concurrent projects because of their impact on this important resource.

5) A full study of the "no-build" alternative, including traffic management techniques, should be aggressively investigated.

6) Throughout the Draft EIR, statistics relating to traffic continually refer to 1987 figures. It seems curious, to say the least, that such figures are used to illustrate a garage/opening impact in 1985. It would seem that more appropriate statistics are necessary.

7) The continual reference to "short-term" access seems incredulous when one reads through the Draft EIR and realizes that this interim solution will last for a period of at least ten years. Given a short-term of ten years, when will said destroyed wetlands be replaced and, given unknown funding, at what quality level? The M.B.T.A., in its agreement with the Town of Arlington re the tailtrack extension project, promised to restore destroyed wetlands when the tailtracks were finished. Proposed alternatives negate these promises.

8) Section V of the Draft EIR provides two sentences only for the discussion of the protection of wildlife. Why is the effort on such an important issue so superficial? The protection of migratory birds and their habitat is under the jurisdiction of the F.B.I. Its priority is within the top ten of a list of twenty-five (25) mandates. Has anyone investigated these guidelines?

Given the above Arlington Conservation Commission concerns, and the lack of response to the MEPA instructions on the part of the M.B.T.A., we request a new Draft EIR prior to a final EIR.

Thank you for your attention. If we can be of any assistance in the future, please let us know.

Very truly yours,

Stephen J. Gilligan

Stephen J. Gilligan
Chairman

cc; M.B.T.A., Linda Jonash, Town of Arlington departments

CONSERVATION COMMISSION

TOWN OF BELMONT

TOWN HALL

BELMONT, MASSACHUSETTS 02178

8 May 1984

Mr. James S. Hoyte
Secretary of Environmental Affairs
c/o MEPA Unit
100 Cambridge Street
Boston, MA 02202

RECEIVED

MAY 10 1984

OFFICE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS

Subject: Draft Environment Impact Report
MBTA Alewife Station
Interim Access
Arlington and Cambridge, MA

Dear Secretary Hoyte:

We have reviewed the Draft Environment Impact Report, MBTA Alewife Station Interim Access, EOEA #4931, by Sverdrup & Parcel and Associates, Inc., dated March 1984, and we offer the following comments:

1. The concerns of the Belmont Conservation Commission relate to loss of wetland area, loss of flood storage area and increased runoff from paved areas. Little Pond and Little River provide storage for a significant portion of the surface water runoff for the Town of Belmont. The floodplain in this area has been greatly reduced throughout the years, causing the incidence of flooding upstream in Belmont to increase. Further loss of wetland and flood storage area will increase the incidence of flooding in this area and result in substantial damage to the Town of Belmont.

2. The report indicates the wetlands impact and compensatory storage requirements for the alternatives considered. However, the report does not indicate how and where the replacement for the loss of wetlands and compensatory storage will occur. The final report should present details for replacement of wetlands and compensatory storage.

3. The draft report does not address retention systems to mitigate effects of increased runoff from paved or covered areas. The final report should address these issues and the design should provide for retention systems or other measures to mitigate increased runoff.

Sincerely yours,
CONSERVATION COMMISSION, TOWN OF BELMONT

Kenneth L. Recker
Commissioner

CITY OF CAMBRIDGE

57 INMAN STREET, CAMBRIDGE, MASSACHUSETTS 02139 • TEL. 498-9048

CONSERVATION COMMISSION

May 8, 1984

Secretary
Executive Office of Environmental Affairs
20th Floor
100 Cambridge Street
Boston, MA 02202

RE: EOEA #4931

Dear Secretary Hoyte:

The Cambridge Conservation Commission has reviewed the DEIR for the MBTA Alewife Station Interim Access Improvements.

As you know all of the alternatives discussed in the DEIR, except for no-build, come under the jurisdiction of the Wetlands Protection Act, which will require the MBTA to come before this Commission for an Order of Conditions. Our hope is that by conveying our concerns at this time, the interests of the Wetlands Protection Act will be better served by being weighed in the alternative evaluation rather than after a decision is made to chose one alternative. We were pleased to see the statement in the DEIR that the project's impact on the MDC reservation, on wetlands and on the floodplain's ability to retain floodwaters are essential elements in the evaluation of alternatives (p. 29).

It is our understanding that on May 15, Secretary Salvucci will select a "preferred" alternative which will be given more detailed treatment than the others in the FEIR. While we recognize EOTC's desire for this decision at this time, we do not believe that the DEIR contains sufficient information on wetlands and on floodplain impacts to permit a balanced decision.

Our reasons are as follows:

- The wetlands to be affected by the various alternatives are incompletely described. No information is provided on the value of these wetlands, and the stress that they are now undergoing due to the cumulative impacts of other projects in the area.
- Although the DEIR states the maximum wetlands loss would be 3200 square feet, there is no information to support that conclusion.
- The effects of each alternative on wetlands and flood-plains are described only in very general terms by indicating the numbers of square feet of wetland or cubic feet of flood storage to be lost.

- Throughout the DEIR, there is an unsupported assumption that the losses of wetlands and flood storage capacity can be mitigated for all alternatives, however, there is no specific information as to how this will be accomplished, and where. For instance, on p. 97, the DEIR states that wetlands impacts of alternatives 1, 3A and 4 could be mitigated by "replacing the wetlands within the Alewife Reservation". What wetlands are referred to here, and what is meant by replacement is not clear.

  Compensatory storage volume of up to 223,000 cubic feet may be required depending on the alternative, yet no explanation is given as to how it will be accomplished other than to state that the abandoned freight cut-off right of way or other MBTA owned areas will be used.

- The DEIR does not describe in any detail how construction impacts, such as erosion and sedimentation, will be mitigated, nor does it explain how or whether affected areas will be restored after the short-term access road is removed. We believe it is important for these issues to be addressed in the FEIR rather than deferred given the MBTA's poor record in protecting wetland resources during the construction of the garage.

- The DEIR describes the wetlands on the W.R. Grace property as being not sensitive or valuable but does not provide any information to support this conclusion.

The Conservation Commission believes that these deficiencies should be corrected in the FEIR and that until this information is available the true costs and benefits of each alternative have not been adequately assessed.

Sincerely,

Dorothy Altman

Dorothy Altman, Chair
Cambridge Conservation Commission

CITY OF CAMBRIDGE
COMMUNITY DEVELOPMENT DEPARTMENT
City Hall Annex - Inman & Broadway - Cambridge, Mass. 02139

498-9034

May 8, 1984

RECEIVED
MAY 9 1984
OFFICE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS

Secretary James S. Hoyte
Executive Office of Environmental Affairs
100 Cambridge Street - 20th Floor
Boston, Massachusetts 02202

Attention: MEPA Unit

Re: MBTA Alewife Station Interim Access
EOEA #4931

Dear Secretary Hoyte:

The Cambridge Community Development Department has reviewed the Draft Environmental Impact Report for the above referenced project and offers the following comments:

- Of the five alternatives presented in the report, we feel that Alternative 4 offers the best solution to providing access to the Alewife Garage/Station. However, we are concerned that this temporary solution not be viewed as the final solution to the access problem. We urge the MBTA/DPW to proceed as rapidly as possible with the completion of the permanent Route 2 improvements.

- The non-structural alternatives presented in the report, i.e. traffic management techniques etc., should be implemented in addition to, not in place of a build solution. Although the implementation of Alternative 4 will alleviate much of the traffic impacts in the area, it will not be enough. It seems prudent, in light of the projected future development at Alewife, that these programs be started now.

- Little mention was made of pedestrian and bicycle access in the implementation of the interim solution. Such access accommodations should not wait for the permanent improvements, but should be provided during this interim construction.

- In the report's discussion of wetlands and flooding (p.97) the second paragraph states that "the location of the compensatory storage area will utilize the abandoned Freight Cut-Off railroad right-of-way lying west of its junctions with the Lexington Branch right-of-way as much as possible. The goal is to utilize all areas for

compensatory storage that are currently in MBTA ownership".

- . Is there enough storage capacity in these areas?
- . If not, what other areas are under consideration?
- . Would the Freight Cut-Off right-of-way still be available for bicycle/pedestrian connections to Blanchard Road in Belmont?
- . The Freight Cut-Off right-of-way is a raised berm which acts as protection for the Alewife Triangle from flooding of the Little River as can be seen from Figure V-D (1955 Storm of Record) found on page 55. If this berm were removed, what would be the impact on flooding in the Alewife Triangle?
- . The Final EIR should explore more creative methods of providing compensatory storage. Alternative methods might include the creation of public amenities such as the Alewife Canal proposed in the Alewife Revitalization Plan. Such an alternative would obviously be more desirable and attractive than those proposed in the Draft EIR.

- In the report's discussion of carpool parking fees (p.99) the third paragraph states that "It would appear then that the price sensitivity to carpooling is somewhat low for the range of parking fees apt to be charged at Alewife and that special or discounted carpool fees are not a relevant pricing strategy at this time."

  - . This fact may be true given the current low parking fees charged by the MBTA at its existing parking facilities. Would it still be true if the fee for single occupancy vehicles were raised to $5.00 per day or higher?

- On page 22, Table II-1, the 1987 Traffic Impact in Predominant Direction should reference Figures VI-J and VI-K, not Figures VI-F and VI-G.

- On page 78, Table VI-D, the 1987 Build V/C for Alewife at Rindge under Alternative 4 should be 1.66, not 1.25.

- On page 79, Table VI-E the 1987 Build V/C for Alewife at Route 2 Rotary under Alternative 4 should be 1.11, not 1.0.

In closing, I would once again urge that all possible speed be taken in implementing a build solution both for the temporary and permanent solutions.

Sincerely,

Kathy A. Spiegelman

Kathy A. Spiegelman
Assistant City Manager for
Community Development

KAS:rr

cc: George Teso
Carolyn Mieth

Mystic River Watershed Association, Inc.

May 1, 1984

James S. Hoyte, Secretary
Executive Office of Environmental Affairs
The Commonwealth of Massachusetts
100 Cambridge Street
Boston, MA 02202

Re: Draft Environmental Impact Report
Alewife Station Interim Access (EOEA #4931)

Dear Mr. Hoyte:

The DEIR #4931 contains in its first pages the proponent's ENF of September 15, 1983, which describes the two original ramp alternatives from the garage to Route 2. The MBTA notified MEPA, by ordinary letter of October 12, 1983 that it was amending the ENF by three additional items, which the MEPA certificate of October 24, 1983 (which the DEIR also contains) lists as items i, ii, and iii. The certificate approves i and ii, the reconstruction of the Rindge Intersection and a road segment on the west side of the garage, but characterizes iii as a significant project change. MEPA states that it is foregoing its regular process because of an emergency under 301 CMR 10.09 (DEIR p.18). As it turned out, there had been no emergency situation (see MDC letter of 12/29/83 to Judith Pickett) and the bridge is still in use.

Moreover, the MBTA letter of October 12, 1983, has not yet been made part of the public record. It should be included in the FEIR. The letter was discussed at the scoping session of October 13, 1983, at which the written comments of the MRWA were discussed at length. The comments covered two groups of alternatives to the two MBTA ramps. The two adidtional groups were not environmentally damaging structures and Non-Structural Transportation Systems Mangement Techniques (TSMT). The Certificate of October 24, 1983, contrary to MEPA tradition, did not instruct the proponent to respond to them (it) in its DEIR; nor did it add the usual catch-all instruction to respond to all public comments received during the review period. That ommission is having the most unfortunate consequence during the deliberations of the ramp project in the ATAC which a MEPA observer has been witnessing. The ommission has a negative effect on the treatment of the MRWA scoping suggestions in the DEIR as detailed herewith. The MRWA is requesting that MEPA insist that the FEIR responds and reacts according to the Mass. Env. Pol. Act.

5-1-84/HWM

To: James S. Hoyte, Secretary
Executive Office of Environmental Affairs (EOEA)

From: Mystic River Watershed Association, Inc. (MRWA)

Subject: Draft Environmental Impact Report (DEIR)
Alewife Station Interim Access (EOEA 4931)

Summary

The proposed project, a direct connection between the Alewife MBTA Station/Garage and Route 2, is to serve as an interim connector pending the completion of the Massachusetts Department of Public Works (MDPW) Route 2/Alewife Brook Parkway improvements project. Completion of the MDPW project is anticipated in 1987. Other improvements, including the Alewife Brook Parkway-Rindge Avenue Intersection (Rindge Intersection) also are contemplated, although not included in the DEIR. "These improvements would be adequate for the station and garage alone until the MDPW can complete its highway improvements", states the DEIR (p.25). Therefore, there does not seem to be a factual need for the construction of an interim access from Route 2 to the garage. Private development in North Cambridge is mostly still in the planning stage except for a very few buildings, of which Spaulding & Slye's building #1 is one. No substantial additional traffic is to occur in advance of the completion of the MDPW project in 1987.

All traffic volume forecasts in the DEIR are for that 1987 target date, as evidenced by table II-1 (p.22). Thus, it is not immediately clear why any connector should be built temporarily ahead of any access the MDPW may wish to propose for completion on a permanent basis in that year. Consequently, the MRWA submits that no interim access should be constructed. Instead, our recommendation is the "No-Build" proposal, which includes the reconstructed Rindge intersection and several Transportation Systems Management Techniques (TSMT). They can not only compensate for the addition of the garage related traffic increase, but also surprisingly can improve current traffic congestion, as shown by the current Southeast Expressway project.

COMMENTS

I. General Comments

The DEIR does not respond to the EOEA Certificate of October 24, 1983, DEIR page 19, third paragraph, which asks

(a) that the No-Build should be studied in light of prior MBTA conclusions that existing access would suffice,

(b) whether phased openings of the garage, with careful monitoring of traffic conditions is a reasonable planning strategy, and

(c) that a separate section should indicate the relationship to other projects including the long-range DPW project which still lacks a final alternative.

The assumed completion date of 1987 for the permanent road improvements by the MDPW is unrealistic according to the MBTA's own consultant. Thus, interim access ramps may well remain in place for years. Moreover, common experience shows that so-called temporary solutions remove the urgency of the originally intended permanent plans. The pragmatic result is that the interim ramps may well stay indefinitely for the foreseeable future.

The public open space at Alewife is, in the opinion of this commentator, in danger of significant long-term impact, which MEPA is mandated to prevent. A comprehensive hydrology study has to be performed and its recommendations published before any construction can be implemented at Alewife.

The DEIR makes the impression that its purpose is to justify preconceived decisions. It seems to be necessary to prepare a revised DEIR. It does not suffice to correct the flaws in the FEIR, because its comments would not permit the EOEA to ascertain their elimination.

II. Detailed Comments

The DEIR Summary (p.23): "It is essential to devise some interim access . . . ."(par. 5). As it stands in the text, this statement is a preconceived conclusion without discussion which tends to predispose the reader favorably. We suggest to complement it by adding, e.g. "or apply some management techniques. . . ."

par. 6: The five alternatives selected include the No-Build, but fail to mention its management options. As a consequence, the table II-A (p. 22) only shows the No-Build data without any management techniques applied. The reader is deprived of the comparative information which he needs.

The three following paragraphs suffer from the same omission. There is no mention of a 1987 scenario with one or several of the techniques applied. Moreover, it should be remembered that the objective of the DEIR is to address the problem of garage opening next year. Except for one or two developments, e.g., Spaulding's building #1, it seems doubtful that major buildings will be occupied by 1987. It seems essential for the table to include the traffic situation at opening time, i.e., next spring.

Project Description: (p.25): par. 4 repeats the original statement of the 1977 EIS and those of the T representative and consultant to the ATAC that the station/garage opening next year will function with access from existing streets, i.e., Rindge Avenue Extension. Traffic will not be seriously impacted before 1987 by either the garage opening or development.

The last three paragraphs of p. 25 are, therefore, concerns with a scenario, for which there seems not to be any urgency. Not even Spaulding will rent its #1 in 85/86. Moreover, the project description continues the omission of the Summary above. It ignores garage management strategies and makes the reader forget about them.

Alternatives: (p. 29 - 49), items 6 and 7 on p. 29: It is doubtful that the costs of the interim ramps are justifiable when management options are considered on equal footing, as EOTC has indicated they would. As to the Triangle developments and their use of the interim ramps, the readers should be told that the test is referring to the post-1987 period; otherwise par. 7 might well confuse them.

Chapter IV.B & C.; the lists of alternatives continue to ignore the management options of the No-Build.

No-Build Alternative (p.31): Again, there is no mention of the garage / traffic management techniques. One reader used the table of content (p. i) and found the item "No-Build/Garage Management" listed for p. 31. He got to wonder what has happened to the Garage Management options of the No Build on the way from p. iii to p. 31.

Alternative 1. (p. 36): The list of required permits omits the federal DOT provisions. However, the proponent might wish to consider the Commonwealth's current difficulty in obtaining federal aid for Alewife projects because of the FHWA's displeasure at segmentation — which the use of public urban open space for the option 1 may raise further. Another question concerns the July, 1985 completion date. The several appeals to be expected by the Wetlands Protection Act seem to make that date overly optimistic.

Alternative 2 (p. 39): Is the cost of the bridge repair included in the project cost and in the anticipation of a ramp opening in July 1985? The use of wet- and parklands for staging purposes should be recorded, as well as the Little River crossing.(third par.)

Alternative 4 (p. 49): Appeals from Wetlands Protection rulings might well delay the completion beyond the estimated August 1986 date, so that the interim period before the permanent improvement date would become negligibly brief.

Chap.IV-D, Selection (p. 49): "Comments will be considered and responded to in a FEIR"would leave this member, i.e.,the MRWA, without the legitimate opportunity to efficaciously respond to the potential of management options. That impossibility appears to require a revised DEIR, including a review, in advance of the FEIR.

V: Wetlands, Parklands, Flooding (p. 51 - 59)
V.A Description of the Environment: Mention of indirect and staging impacts should be made.

V.A.2: Flooding, informs that the entire area is within the flood plain. The CDM recommendations have not been implemented and would require funding support to occur in the foreseeable future.

VI Traffic. The study area (Fig. VI-A) should include Belmont Center and Route 60 both sides of Route 2. The City has issued already an EIR. It does not propose a mere reconstruction, but extension to Concord Avenue. The project is stalled, since the FHWA refuses to fund an EIS phase because of the lack of consolidation with the permanent Alewife highway improvements of the MDPW according to federal law and DOT Program Manual 7-7-2, i.e., because of segmentation.

VI-A 2, third par.: it should correctly be in the future tense.

VI.B.2 Analysis Assumptions The analyses compare the 1982 traffic volumes with those projected by Spaulding & Slye for 1987, which are updated. The 1982 volumes should have been updated. More importantly, the EOEA instructed the MBTA, it should study the No-Build in the light of prior MBTA conclusions that existing access would suffice. The present DEIR confirms those conclusions, if the items i and ii on page 18 are implemented. The project is to provide a short-term little solution when the garage opens; it is not its purpose to provide the equivalent of the permanent solution, which will be the task of the MDPW in 1987. Therefore, one has to conclude that no interim access ramps are necessary. (p.66)

The effort of the DEIR to assume traffic forecasts for 1987 is not immediately clear. As a matter of record, the CTPS is working at a comprehensive forecast with MPO funding which is due this summer. It would seem to be more economical to wait until those data are available and let the MDPW consultant evaluate them for his permanent improvements.

The present statistics appear to be nothing more than guesswork based on insufficient data. (See: Traffic Projections and Analyses prepared by Norman A. Abend et al for the Cambridge Community Development Department, April, 1984.)

The tables VI-B to E on p. 76/79 compare the traffic volume/capacity ratio (V/C) and level-of-service (LOS) of the 1982 condition, with and without a new Rindge intersection, first with a 1987 No-Build, either unconstrained or constrained (with diversions), and second, with the 1987 alternatives 1, 2, 3a and 4. There is no comparative V/C and LOS for any of the non-structural garage/traffic/parking management techniques to be found on any of the tables or anywhere in this chapter VI.

VIII Measures to Mitigate Impacts

VIII.B Traffic The objective of the subway extension to Alewife is to divert the commuters from their automobiles to mass transit. The MRWA agrees. The DEIR continues: "the best opportunity to achieve this objective is offered by the build alternative"; the MRWA disagrees. Traffic management strategies are more flexible, cheaper and can be switched on and off at will; they require no substantial capital investment for temporary facilities.

Transportation Systems Management Techniques (TSMT), p.98

1. Pricing Restraints

First par.: Other than rigid high or rigid low fees would be more meaningful, e.g., high fees during the 7 to 9 A.M. period, low fees before 7 for early birds and after 9 for pleasure, e.g. shopping, commuters.

Second par.: The T has intended to require two tokens — at least for the down town direction — and made its cost/benefit calculation for the extension to Alewife on that basis. The DEIR should make an analysis for both 1 & 2 token fares.

Item 1.b. See above under first par. The chief of operations should play it by ear. That possibility is precisely the advantage of non-structural alternatives.

Second par. of 1.b. As explained above, one can adjust the fee differential so that no empty spaces remain. The conclusion of the DEIR that this strategy

would "run counter to the general objectives of constructing the extension" is not immediately apparent. On the contrary, such late parkers may not stay a full working day downtown. Thus, such spaces can be filled by more than one daily parker.

Item 1.c. The skepticism of the DEIR does not seem to jibe with the reports of the Caravan, Inc., a non-profit corporation funded by MPO. The DEIR should have given a more comprehensive description of the overall Wellington conditions. The DEIR's conclusion that special treatment of carpools destined for transit stations is not relevant, is not immediately clear. It is tailor-made for Alewife, in the opinion of several Alewife developers.

2. Physical Constraints

2.a. Staged Opening: the DEIR describes an improbable scenario. If one would open only half of the garage, one would monitor the effect and proceed according to observations of the factual impact. There are other techniques available to the garage manager. The T has proposed itself in 1982 that it would open the garage slowly and in steps and monitor the results. That easy opportunity is one of the pertinent advantages of TSMT's over interim access structures.

The wholesale conclusions of the second par. that garage access and egress restrictions during certain hours would hurt transit usage and income, garage revenue, traffic diversions and LOS, and that 20% of the expected modal shift would be lost are not convincing.

2.b. Limit Parking by Time of Day: This technique would manipulate the filling and emptying of the garage in a manner to make these operations less tiring and time consuming for patrons and staff alike. It would distribute parkers and impact non-garage related Alewife traffic less abruptly. It is not readily apparent why it would "merely drive away potential transit riders."

The second par. addresses the problem of left-over empty garage spaces without johnnies-come-lately being aware of them. Such missed opportunities can readily be avoided by the usual "garage temporarily filled" illuminated red signs at the two rotaries and the Rindge intersection.

The third par.: It seems to be not immediately clear why well planned availability and pricing techniques should have negative effects like reducing transit ridership and car diversions to transit or worsened LOS.

3. Other Mitigating Measures (p. 101)

They have been proposed by "a member of the ATAC". The MRWA agrees with his conclusion that their implementation would "alleviate traffic and parking congestion at least to the degree advocated by the proponents of the structural temporary solutions". The main body of the DEIR does not compare them with the four interim access alternatives proposed by the DEIR and merely states that their effects are inferior to the structural alternatives. This is a conclusion rather than proper argument supported by empirical data.

IX Relation to Other Projects

The chapter relates the Alewife Station Interim Access Project to the following:

Alewife Station/Garage of the Red Line Extension (RLX)
Alewife Garage West Roadway of the RLX
Alewife Brook Parkway Freight-Cutoff Bridge of the RLX
MDPW Upgrading of Route 2 of the RLX
Alewife Boulevard of the City of Cambridge
Restoration of the Lexington Branch Railroad
MAPC Open Space Study
Private Development Projects.

All those relations to other projects—except for the railroad restoration and private developments—are to federally funded projects which are geographically proximate and functionally interdependent. Federal laws and regulations, which are conveniently summarized in the DOT Program Manual 7-7-2, require for such projects several procedures, among them the:

designation of a lead agency (par. 7)
coordination with other facts (par. 9)
single consolidated EIS (par. 13 and 15)
supplemental statements (par. 16)
section 4(f) statement (par. 20)

The Alewife Station/Garage of the RLX has yet to implement those procedures. The fact that this has yet to be done is causing some funding difficulties for the environmental review phase of the MDPW Alewife highway improvements, the Alewife Boulevard and possibly the Truss Bridge replacement, since it appears that the FHWA considers the handling of the RLX Alewife projects as segmentation of a single package. The T seems intent on forgoing federal aid for the interim access project. It remains to be seen what consequences that action might entail.

Appendix G: Memo of March 14 from D. D'Eramo to L. Jonash & D. Kidston

The first sentence of D'Eramo's memo states that he will assess the MRWA proposals "to reduce the projected 1987 traffic volumes at the intersection of Rindge Avenue Extension and the Alewife Brook Parkway." That statement is erroneous in two points. The MRWA describes in its memo of February 15, 1984, a number of garage and road traffic volume related transportation systems management techniques in the eventuality that the impact of the station opening requires them in the interim. They have not been intended to reduce traffic volumes in 1987, when the MDPW improvements are in place and the first developments start to be occupied, among them Spaulding #1. The other error is that the MRWA proposals address the Alewife problem in an overall way, and not merely one important intersection.

Thus, D'Eramo's inclusion of 1,343 ADT from the Triangle developments on p. 1 should be eliminated.

Section 1: First sentence on page 2: The question is irrelevant since it concerns the monitoring early weeks only. Besides, it's the T's own 1982 proposal.

Section 2: First sentence: "The current, 1982, LOS will never be better than presently exists without highway improvements" ignores some of the TSMT's which produce relief.

The next sentence assumes that development generated traffic will help to increase traffic peaks by 40%. It is not readily apparent why that increase is assumed to be relevant for garage generated effects at opening time, i.e., in 1985.

The third sentence questions whether car pooling is currently dominant at transit stations. It may not be; but certainly will be a very helpful factor at Alewife and should be encouraged, e.g., with assist from Caravan, Inc., the T and MDPW.

The second paragraph suggests that car pooling may be a washout. That evaluation is based on the unrealistic assumption of a parking limitation to three-person occupancy cars. Operational costs to the T should be small compared to the investment in structures.

3. Reserved Parking Spaces
D'Eramo claims that this measure would prevent traffic reduction in peak hours. However, 90+% of the reduction will be achieved, when such reservation is practiced.

4. Carpools
D'Eramo's comment is based on a misunderstanding. The MRWA is aware of Spaulding's "built-in assumption" and is uses his occupancy rate in its memo. The MRWA is suggesting that there remains much room at the top.

5. Parking Demand
D'Eramo's reference to City of Cambridge minimum parking requirements is irrelevant for the MRWA suggestion. Building owners would like to attract tenants by offering ample parking. Spaulding is thinking of bonuses. The City should initiate for general zoning districts, other than PUD, a site plan review.

6. Shared Taxi, Shuttle & Subscription Buses
The reference to Newton and Logan requires a closer look to detect whether there are pertinent differences from the Alewife condition. The Caravan, Inc. may be helpful to D'Eramo. The AD Little Corporation has started shuttle service. The Northwest Corridor Service Study of the T is considering Alewife minibuses similar to the Boston Common's Garage centered rides around the downtown shopping district.

7. Subway
Again, a misunderstanding. Possibly, the MRWA has been polite to a fault. The modal split figure of the MRWA had been taken over from Spaulding. The fact that they were also used by Sverdrup's subconsultant is immaterial for the purpose of the MRWA raised issues. The MRWA is trying to rise a tiny red flag. Not always is the T at its best. The MRWA just wants to ask the T to, please, be careful with all that good taxpayers' money and make the future Alewife borders like the new extension. The MEPA representative attending the past Alewife meetings is well aware of the many problems with the MBTA plans.

8. Bus Service
Again, another misunderstanding. This time between the T's high command and the Northwest Corridor Service team. That team is planning future Alewife destined feeder bus lines. Convenient, ample fringe parking facilities for

outlying commuters at the outer bus terminals will be important for private automobiles. It would seem timely to secure appropriate parking areas at those terminals as soon as they have been decided. Don Kidston says that the study is looking into such parking areas. The study manager says, that this is not included in their contract scope. D'Eramo's conclusion that the reduction of traffic projections is possible as a result of this MRWA alternative misses the point. The question is to get the T to act, to act timely and well.

9. Flexible Work Schedules

D'Eramo quotes instances of a 2% traffic reduction and adds that a 5 to 10% peak hour reduction seems very optimistic. On the other hand, flex time eliminates one work day out of ten. That amounts to 10%, when arithmetic is being used. Does it not?

Conclusions and Goals

D'Eramo states that traffic projections at Alewife for development already incorporate many of MRWA's proposals. The MRWA is pleased by that comment. However, the MRWA non-structural alternatives have been addressing short-term solutions, i.e., possible problems at garage opening in 1985. They are in competition with the short-term access options. If they have proven their worth and are popular in 1987, the MBTA and MDPW may once see eye to eye and decide not to object to their continuous application when the major development impacts occur. The MRWA would not object either.

D'Eramo's comment that his analysis does not support (the italics are his) the MRWA's conclusion seems to be somewhat deficient in completeness, depth and correct understanding of what is to be analyzed. He may wish to reanalyze with an open mind.

The DEIR discusses the four structural finalists in Chapter IV. Its own non-structural alternatives are mentioned at the end of the report in Chapter VIII among an assortment of items like flooding, parkland and air pollution. Thus, the members have a difficult time to relate and compare the two kinds of alternatives. Worse, the DEIR analyses the MRWA proposals on the very last page of the volume in appendix G. No reviewer can be expected to come to a firm recommendation by reading such a disorganized document.

The DEIR has deprived the public of a comparative analysis, and made it difficult for busy commentators, who have their own working lives, to notice the non-structural options.

CONCLUSION

It is the position of MRWA that the DEIR puts forth an argument that is inappropriate. It uses 1987 statistics even though it argues for a project that is to be in existence before the 1987-planned permanent improvements. Furthermore, it runs roughshod over legitimate and legally protected environmental concerns, by minimizing the non-structural management proposals with questionable statistics. For example, at page 100 it states that a staged opening of the garage could cause a loss of 15%-20% of the "expected 5,200 daily automobile diversions to transit". It is our contention that a net loss of approximately 1000 trips (which figure may very well be less than the statistical error built into every such analysis) over roads that currently accommodate

approximately 60,000 average daily trips is not so significant compared with the environmental damage that would result.

The MRWA stands by the conclusions and goals stated in its memo of February 15, 1984 on Non-Structural, Traffic-Management Alternatives wherein it was stated that steps such as those outlined therein would alleviate traffic and increased parking congestion at least to the degree advocated by proponents of the structural temporary solutions.

Moreover, the non-structural management techniques may well improve the present traffic conditions noticeably as they have for instance, shown to perform at the opening of the Southeast Expressway Reconstruction. (See: Reconstruction Bulletin dated 4/10/84 prepared by MAPC and MDPW.)

WINN BROOK ASSOCIATION

BELMONT, MASSACHUSETTS 02178

THOMAS P. CALLAGHAN, President
17 Eliot Road
Belmont, Mass. 02178
Phone: 484-1917

May 5, 1984

RECEIVED
MAY 8 1984
OFFICE OF THE SECRETARY OF
ENVIRONMENTAL AFFAIRS

James S. Hoyte, Secretary
Executive Office of Environmental Affairs
100 Cambridge Street, 20th Floor
Boston, MA 02202
ATTN: MEPA Unit

Dear Secretary Hoyte,

While our organization considers that a capable job has been done on the Draft EIR for the MBTA Alewife Station Interim Access, EOEA # 4931, we believe that it has a couple of weaknesses and, most importantly, points up the need to halt piecemeal planning in the Alewife area.

1) It does not appear that certain questions in the scope have been answered in the draft. They concern the dubious assumptions that existing access would suffice for the Alewife station.

2) What would be the capacity during the PM Peak Hour in 1987 for the Alternate 4 exit road at the signalized intersection at Alewife Brook Parkway and Route 2 ? What is the storage capacity of this exit road from the garage to the intersection? What is the traffic volume forecast for the Grace development's contribution to this road?...for ADL?

3) Does not the Federal Highway Administration under CFR 23, 771.105 or MEPA under 301 CMR 10.10 have a responsibility to demand comprehensive environmental planning? One of a dozen pertinent questions pointing up a lack of coordinated planning is: If the Alternate 4 exit road develops a Level of Service F, and Alewife Boulevard is built, will not a high volume of PM Peak Hour traffic exit via Smith Place and Concord Avenue to add to the westbound traffic that is already flooding the Winn Brook neighborhood of Belmont?

4) Your office has been most zealous and effective in surfacing environmental issues at Alewife, but we now ask whether it shouldn't demand a study of the impact of inadquate planning on property values and the quality of life in Belmont neighborhoods such as Winn Brook.

Very truly yours,

Tom Callaghan

Acorn Park
Cambridge, Massachusetts 02140
617 864-5770 Telex 921436

Arthur D. Little, Inc.

May 3, 1984

Secretary of Environmental Affairs
Attention of MEPA Unit
100 Cambridge Street
Boston, MA 02202

Dear Secretary Hoyte:

This letter concerns the Draft Environmental Impact Report on Alewife Station Interim Access on behalf of Arthur D. Little, Inc.

We are writing to express our comments on the above-mentioned report and our comments are made with the background that highway changes have historically come very slowly in the Alewife area. Therefore, one needs to consider that the interim access to the MBTA station may in fact become a long-term, if not a permanent, solution. We strongly recommend Alternate Number 4 as it provides what we believe is the best solution for handling the traffic in a safe manner. This alternate eliminates a need for a traffic light on Route 2 for stopping eastbound traffic.

We would like to suggest one modification to Alternate Number 4; namely, a connection at the merge point of the eastbound and westbound access road at the western corner of the garage. This would provide an opportunity to reverse direction using those two ramps.

Should the westbound proposal of Alternate 4 not be considered possible, we believe that Alternate 2 is preferable to Alternate 1.

Sincerely yours,

D. Reid Weedon Jr. c+s

D. Reid Weedon, Jr.
Senior Vice President

/ceb

Dictated by Mr. Weedon
and signed in his absence

MUGAR/FINARD
ASSOCIATES
ONE BURLINGTON WOODS DRIVE
BURLINGTON, MA 01803
(617) 273-5555

May 3, 1984

Ref: 0162

The Honorable James S. Hoyte, Secretary
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, MA 02202

Attention: MEPA Unit

RE: MBTA Alewife Station Interim Access DEIR (EOEA #4931)
March, 1984

Dear Secretary Hoyte:

Review of the DEIR, in light of my familiarity with the Alewife area, confirms my belief in the need for area transportation improvements. With respect to the four build alternatives proposed for interim station access, it would appear that Alternative 4 offers at a reasonable cost the greatest level of traffic relief for the area during both the morning and evening peak hour conditions. As such, Alternative 4 should be further developed in an environmentally sensitive manner, and in conjunction with employer-based traffic demand modification strategies such as ridesharing programs, variable work hours, support of MBTA pass programs, and others.

However, as the developer in the proposed Arlington Office Park, I am deeply concerned by the statement contained in Section IX, Relation to Other Projects, (p. 107) that, "No direct relationship is seen between this (Mugar-Finard) proposal and the interim access project although a close relationship exists between the development (Mugar-Finard) and Route 2." It is implied that since access to the Mugar-Finard site was not considered in the development of interim station access alternatives, it follows, therefore, that there can be no relationship between projects. The rationale behind this presumption is that interim station access will be, by definition, a short-term temporary situation, and that access to the Mugar-Finard site will be coordinated through the present EIS process concerning the MDPW proposal to upgrade Route 2.

Nevertheless, a review of the history of project development of transportation improvements within the Alewife area, in light of funding realities, suggests strongly that the interim station access plan while "temporary" in nature may in fact be the extent of roadway improvements to Route 2 for the next 10 to 20 years. The fact that design and construction of the interim

station access plan will be totally funded by the Commonwealth of Massachusetts is indicative of the scarcity of present and future federal resources and the longer project development process if federal funds were utilized. Assuming that the environmental, design and construction process of the long-term Route 2 improvements is expedited, a minimum of 6 to 8 years would be required. This time frame assumes agreement at the neighborhood, local, regional and state levels as to the nature and extent of proposed improvements during both the environmental and design stages of project development, FHWA approval of the "preferred" alternative, availability of federal and state funds for both design and construction, and the continued priority of Alewife area transportation improvements by subsequent state administrations. The history of Alewife project development during the past 15 years, in light of present and future funding realities, suggests that a 6 to 8 year schedule is overly optimistic and that a 10 to 20 year schedule of staged construction improvements to the Alewife area is more realistic, if further roadway improvements are constructed at all. It is not beyond the realm of possibility that the EIS process will result in selection of the No-Build Alternative as the "preferred" alternative.

In light of the above, you must understand my concern and disappointment that access to the Mugar-Finard parcel has been totally neglected in the development of the interim station access alternatives. I wish to point out that site access via a one-way westbound service road from Route 2, as proposed in the DEIR and FEIR (EOEA #4167) prepared for the Arlington Office Park, and developed in close coordination with MDPW officials, is compatible from a highway design and safety perspective with all of the interim station access alternatives, without impacting Thorndike Field. Given the fact that project development of the Mugar-Finard parcel enjoys local official support, has satisfied the state environmental process, the Arlington Redevelopment Board, the Arlington Zoning Board of Appeals and the state Department of Environmental Quality Engineering, and, as such, is a real project in contrast to a number of proposed area developments that have been considered in the analysis, it is imperative that the Final EIR address and assess the compatibility of Mugar-Finard site access with the as yet to be determined preferred interim station access plan, particularly in view of the uncertainty of future long-term improvements to Route 2. Otherwise, the identification and analysis of environmental impacts associated with the interim access station plan will fall short of being comprehensive.

It is my sincerest hope that working together, state, local and private interests within the Alewife area can harness the resources to expedite the necessary area transportation system improvements.

Very truly yours,

George J. Kfouri

Elsie C. Fiore
58 Mott Street
Arlington, MA 02174
648-0077

May 9, 1984

James S. Hoyte, Secretary
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, MA 02202

Re: Alewife Short-Term Roadway Improvements
Cambridge-Arlington - EOEA No. 4931

Dear Mr. Hoyte:

Following are my comments on the Draft Environmental Impact Statement (DEIS) issued in the above matter:

Certificate of Secretary - p. 17-21

The Secretary recognizes the need for careful study of the area because of the environmental consequences of construction and development.

Under "Alternatives" on p. 19, the Secretary states:

> (4) A fourth alternative, to be developed, which does not impact parkland and avoids signalized access onto Route 2 [should be studied] (emphasis supplied).

Alternative 4, which was added after the Environmental Notification Form had already been reviewed by the Secretary, impacts wetlands (which are part of the MDC reservation) and requires a larger volume of compensatory storage than Alternatives 1, 2 and 3. Therefore, it is my opinion that Alternative 4 as described in the DEIR is improperly being discussed.

On page 20 of the DEIR the Secretary states under (1), Wetlands and Flooding,

> The area of MDC parkland disturbed by the MBTA construction has been greater than many observers expected.

It has been the observation of this writer that it is mainly those people with a so-called professional background who insisted that damage could be successfully mitigated by proper safeguards. Citizen observers felt no such confidence and I, for one, appreciate the recognition by the Secretary that this extensive disturbance has taken place. It follows that additional construction and development will with almost complete

certainty cause further disturbance and destruction that may not be repairable by either man or nature. Preservation of the MDC Alewife Reservation should be of paramount importance in this area. If construction and development cannot be carried out with no harm to this delicate area, it should not be allowed.

Summary - p. 23-24

Par. 3 states:

> Several land developments...in the Alewife area...will add to the traffic generated by the MBTA garage.

The stated purpose of the temporary roadway as given on p. 2 of the ENF (DEIR p. 4) is "to further improve vehicular access/egress for the Alewife Station...and ease traffic congestion at the Rindge Avenue...intersection." It is further stated on p.4 (ENF) "Although the station can function without benefit of the direct ramps...there will be considerable traffic congestion in the station area (p.10aENF,DEIR p.16).

Since the MBTA has provided for an extra lane on Alewife Brook Parkway north of Rindge Avenue and turning into Rindge Avenue and the garage, and since, from my observation as a long-time and daily user of parking garages, it is not traffic entering a garage that causes a backup, the additional lane on Alewife Brook Parkway should be sufficient to accommodate cars entering the garage from Alewife Brook Parkway North and Route 2. Furthermore, cars leaving the garage must stop to pay their parking fee at a toll booth and then leave one-by-one. The traffic backup is in the garage, not on the roadway. This leaves the obvious conclusion that traffic congestion will be caused by the additional traffic resulting from new development. It is the opinion of this writer that public funds should not be used for private development and the development proponents should be charged with solving access problems by private means, including scaled-down development.

Page 24, Par. 1 of the DEIR states:

> Where traffic would increase over the No Build with the interim access road in use would be, of course, Route 2...and Alewife Brook Parkway north of Route 2... . Traffic on Alewife Brook Parkway south of Route 2... would

> also increase ... . relieving the congestion at the Alewife Brook Parkway-Rindge Avenue intersection ... . (emphasis added)

It is difficult for the writer to understand what benefit is to be gained simply by shifting traffic from one location to another. Since the facts stated above indicate that interim access is not necessary to serve the garage, it follows that the private developers in the triangle section of Cambridge will benefit the most. However, since the traffic created by the new development will presumably not be using the garage, "interim access to the garage" is a misnomer.

Although it has been said that the interim access could be part of the detoured roadways used during the permanent reconstruction of Route 2, these plans are not shown. Also, even though Alternatives 1 and 2 claim to be within the right-of-way of both the MBTA and the DPW, MDC land must be used for staging purposes. Plans for this staging should be given.

Page 80 of the DEIS, Par. 3e, states:

> ...Build options, as a group, ... would provide the best opportunity to attain the expected diversion of the 7,700 daily automobile trips to transit.

Since the MBTA garage is designed to hold only 2,000 cars, how will the diversion of the additional 5,700 automobile trips be accomplished?

The extension of the Red Line and the building of an "improved" road system is supposed to relieve traffic congestion in Boston and Cambridge. In fact, the extension will attract more traffic to an area that is functioning adequately now and the "improvement" of the roads will attract and encourage more automobile traffic to pass through the area than it can safely carry.

For the above and additional reasons stated by other commentators on the interim access project, this writer is of the opinion that interim access to the garage is not only unnecessary, but undesirable.

Very truly yours,

Elsie C. Fiore

Elsie C. Fiore

Robert J. La Trémouille
ATTORNEY AT LAW

348 Franklin Street
Cambridge, Massachusetts 02139

Telephone
(617) 491-7181

May 7, 1984

Secretary
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, MA. 02202

RECEIVED
MAY 9 1984
OFFICE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS

Attention: MEPA Unit

RE: EOEA #4931

Sir:

I have had an extremely unusual time attempting to obtain a copy of this document, highlighted by MBTA actions which I do not consider constructive. Senator George Bachrach was kind enough to loan me his copy. The Mystic River Watershed Association also offerred to loan me theirs, and forwarded a copy of their submission on this matter.

I find the MRWA submission impressive and complete. Particularly distressing is the MBTA failure to provide the no-build option the level of importance which it deserves and which was directed by the secretary.

Of other possible interest to the secretary are pending zoning changes in the City of Cambridge. So-called "technical amendments" would have direct impact on construction by Spaulding and Slye. Present P.U.D. zoning has provisions "allowing transfers [of development rights] from unbuildable areas to buildable areas" (EOEA 4326, page IV-37). This privilege is only available, at present, to developers holding 20 acres or more of land in the area. Spaulding & Slye owns 18.5. The "technical amendments" would reduce required holdings to .57 acres, five house lots. The C.D.D. has also proposed a change which would have modified maximum allowed accessory parking by changing the limits to limits only in unusual situations. That change was withdrawn when I publicly objected. Both proposals were included in legal advertisements, but neither advertisement included meaningful description of these important aspects. Neither advertisement even quoted the language of the change.

Sincerely,

Robert J. La Tremouille
Attorney at Law

B. MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

The Commonwealth of Massachusetts
Executive Office of Transportation and Construction
Department of Public Works
Ten Park Plaza, Boston 02116

August 20, 1984

Mr. Francis M. Keville
Director of Construction
Massachusetts Bay Transportation
Authority
10 Park Plaza
Boston, MA 02116

Dear Frank:

In response to your request the Department has reviewed the Draft Environmental Impact Report for the Alewife Station Interim Access project and submits the following comments:

1. Since the advent of the Interim Access proposals, the Department has been working closely with EOTC, MBTA, and the consultant firm of Sverdrup and Parcel, as well as the Alewife Advisory Committee, various city, town and local groups etc., in the development of geometrics for the various concepts as well as preparation of the DEIR.

2. The traffic operations and safety analyses contained in the document are satisfactory relative to concerns of the Department.

3. Because the Department staff has been participating in ongoing work sessions with the project staff, opinions and concurrences of the MDPW are already reflected in the document.

4. We are aware that the signalization and reconfiguration of the Dewey/Almay rotary has been subject to considerable engineering design and traffic operations analysis. At this preliminary design phase, the lay-out of the rotary appears acceptable. We do expect to review and comment on the more detailed design drawings as the project progresses.

5. Additional coordination with our own consultant, Fay Spofford and Thorndike, for the Alewife Route 2 proposed improvements has insured that this interim proposal would not preclude any of the options for the permanent solutions.

If you have further questions or comments please contact Walter Gustafson at the Department 973-7458.

Very truly yours,

Robert J. McDonagh

Robert J. McDonagh
Chief Engineer

C. METROPOLITAN DISTRICT COMMISSION

The Commonwealth of Massachusetts

Metropolitan District Commission

20 Somerset Street, Boston 02108

WILLIAM J. GEARY
COMMISSIONER

May 15, 1

Mr. James S. Hoyte, Secretary
Executive Office Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02108

Attn: MEPA Unit
Re: EOEA #4931

Dear Secretary Hoyte:

The Metropolitan District Commission has reviewed the MBTA Alewife Station Interim Access Draft Environmental Impact Report and submits the following comments:

1. Alternative 3A has the least impact on Alewife Reservation and its wetlands and minimizes compensatory storage needs.
2. The proposed signalization of the Dewey Almy Circle is an interesting proposal that meets a number of M.D.C. objectives for the regional park and parkway system. However it needs considerable refinement in terms of alignment, signalization and landscape concerns.
3. Alternative 4 has been endorsed by the members of the Alewife Committee. It meets a primary traffic objective of "directly accommodating inbound garage traffic". It impacts 1.4 acres of Commission property, and requires significant construction within the flood plain. The needed compensatory storage is not shown nor is its location discussed in the Draft EIR. We request that it be addressed in the Final Report.
4. Mitigating measures, to offset the use of park land (4F) for roadway purposes, are not presented. The impacts proposed appear to be significant and mitigating measures to offset these impacts are required. A pedestrian pathway is a desirable but insufficient measure.
5. The final EIR should address the short term and long term impacts. Particular attention should be given to the areas impacted by temporary construction easements. This should include the Dewey Almy Circle area and the phasing of construction.

James S. Hoyte, Secretary May 15, 1985

The Commission will continue to work closely with the EOTC agencies and the community and environmental groups as the Final EIR is prepared.

Sincerely,

WILLIAM J. O'CARY
COMMISSIONER

JBOB/rs

APPENDIX A

MEPA DOCUMENTATION

1. Environmental Notification Form (ENF)
2. MEPA Certificate on ENF
3. MEPA Certificate on DEIR

1. Environmental Notification Form (ENF)

31

APPENDIX A
COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

ENVIRONMENTAL NOTIFICATION FORM

Do not write in this space

I. SUMMARY

A. Project Identification
1. Project Name: Alewife MBTA Station Short Term Route 2 Access Improvements
2. Project Proponent: MBTA
Address: 50 High Street, Boston, MA 02110

B. Project Description: (City/Town(s)) Cambridge - Arlington
1. Location within city/town or street address: Alewife MBTA Station Concord Turnpike and Alewife Brook Parkway (Route 2)
2. Est. Commencement Date: August 1984 Est. Completion Date: January 1985
Approx. Cost $: 1,000,000 Current Status of Project Design: 0 % Complete

C. Narrative Summary of Project
Describe project and give a description of the general project boundaries and the present use of the project area. (If necessary, use back of this page to complete summary).

The project area is located in the Town of Arlington and City of Cambridge and consists of the MBTA's Red Line Right of Way (ROW) from the Alewife Station to a point north of Route 2. This property is currently being used for Red Line construction and will be used for Transportation purposes upon completion of construction. The project area may also include a section of the Concord Turnpike (Route 2) from the intersection of Alewife Brook Parkway to a point approximately ½ mile to the west; land owned and/or leased by the Arthur D. Little Company located at the easterly end of their property and used for parking and roadways; undeveloped land owned by the Metropolitan District Commission bounded by the Arthur D. Little property, Route 2, the MBTA ROW and the Little River.

The proposed project consists of the construction of a temporary roadway which would provide a direct connection between the Alewife MBTA Station and garage and the Concord Turnpike (Route 2). This roadway would function as an interim connector pending completion of the Massachusetts Department of Public Works (MDPW) Route 2/Alewife Brook Parkway improvements project. Completion of the MDPW Project is anticipated in 1987.

A preferred alignment for the temporary roadway project has not yet been selected. Two major options are under consideration. The first consists of a roadway or viaduct from the station/garage in the MBTA's ROW over the Red Line tail track tunnel to the Route 2 bridge which crosses the ROW. The

(continued on Page 2)

Copies of this may be obtained from:
Name: Donald Kidston Firm/Agency: MBTA
Address: 50 High Street, Boston, MA 02110 Phone No. 722-3152

1979 THIS IS AN IMPORTANT NOTICE. COMMENT PERIOD IS LIMITED.

Use This Page to Complete Narrative, if necessary. (cont.) intersection would be signalized to
iit left-hand turns to Route 2 westbound during the evening peak travel hours. The second
option consists of a temporary surface roadway from the garage/station in the MBTA's ROW over
the Red Line tail track tunnel to a point north of the Alewife Brook Parkway; then the road-
way would curve westward, across the easterly Arthur D. Little parking lot to Acorn Park Road
to Route 2. This intersection at Route 2 would also be signalized. It is expected that the
temporary roadway will be approximately 40-50 feet wide and consist of two travel lanes with
shoulders to provide for two-way traffic flow. Further analysis is needed to determine the
final lane configuration.

The purpose of this temporary roadway would be to further improve vehicular access/egress for
the Alewife Station and its 2,000-car parking garage and ease traffic congestion at the Rindge
Avenue/Alewife Brook Parkway intersection.

The analysis and design of this interim roadway will be performed in close coordination with
the MDPW's design and environmental analysis for the Route 2/Alewife Brook Parkway project so
as to maximize the usefulness of the interim roadway during the construction staging of the
permanent improvements.

This project is one which is categorically included and therefore automatically requires preparation of an Environmental Impact Report : YES _____ NO _____ not certain

D. Scoping (Complete Sections II and III first, before completing this section.)

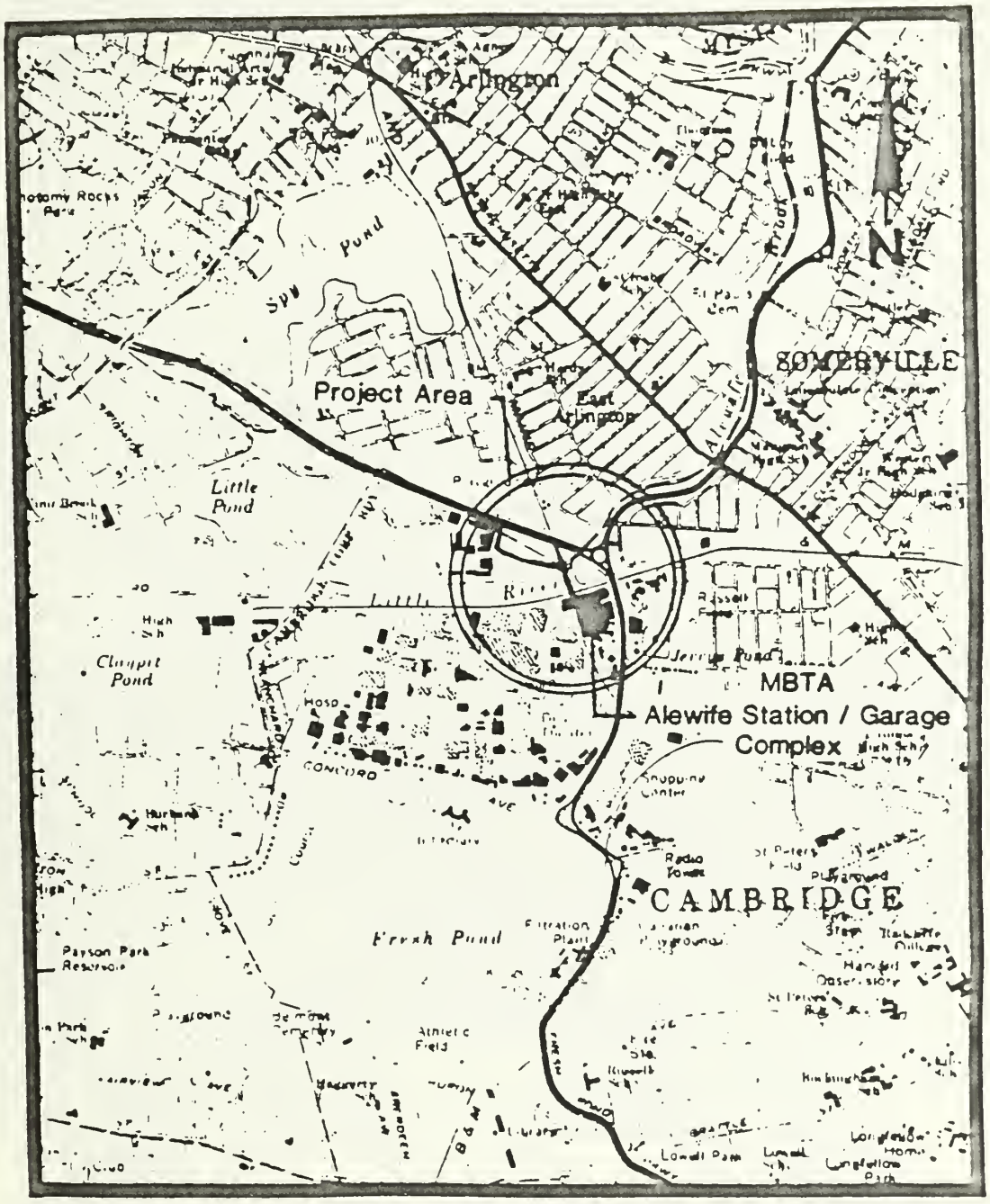
1. Check those areas which would be important to examine in the event that an EIR is required for this project. This information is important so that significant areas of concern can be identified as early as possible, in order to expedite analysis and review.

	Construction Impacts	Long Term Impacts		Construction Impacts	Long Term Impacts
Open Space & Recreation	X		Mineral Resources		
Historical			Energy Use		
Archaeological			Water Supply & Use		
Fisheries & Wildlife	X		Water Pollution	X	
Vegetation, Trees			Air Pollution		X
Other Biological Systems			Noise		
Inland Wetlands	X	X	Traffic	X	X
Coastal Wetlands or Beaches			Solid Waste		
Flood Hazard Areas	X	X	Aesthetics	X	X
Chemicals, Hazardous Substances, High Risk Operations			Wind and Shadow		
Geologically Unstable Areas			Growth Impacts		
Agricultural Land			Community/Housing and the Built Environment		
Other (Specify)					

2. List the alternatives which you would consider to be feasible in the event an EIR is required.

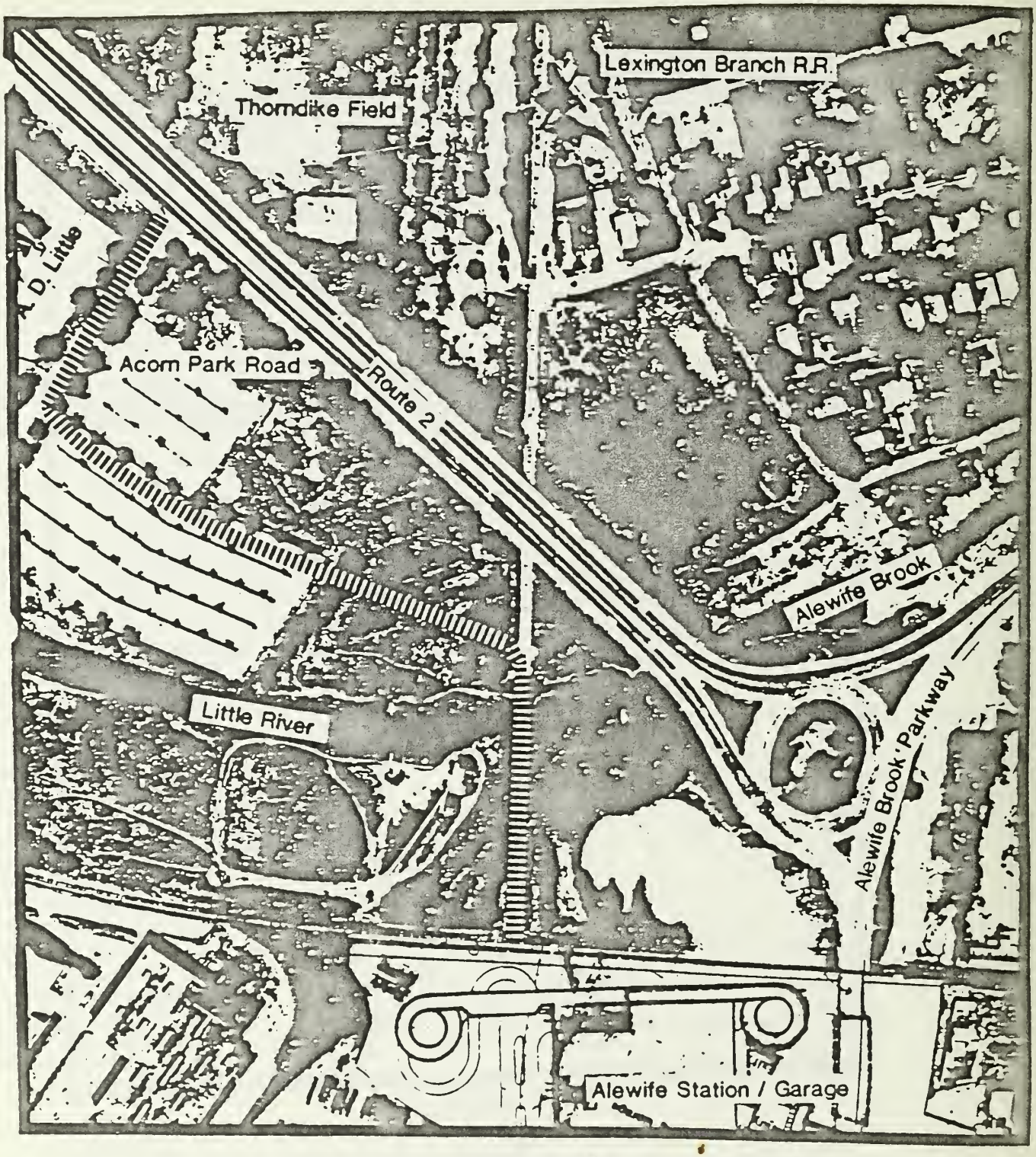
Option 1. Construct an at-grade roadway from station/garage site along the Red Line ROW, spanning the Alewife Brook, A. D. Little parking lot and Acorn Park Road. Provide a signalized intersection at Route 2 and Acorn Park Road.

Option 2. Construct a trestle-type elevated structure in the Red Line ROW from the station/garage site to Route 2. Provide a signalized intersection at Route 2.



SITE PLAN

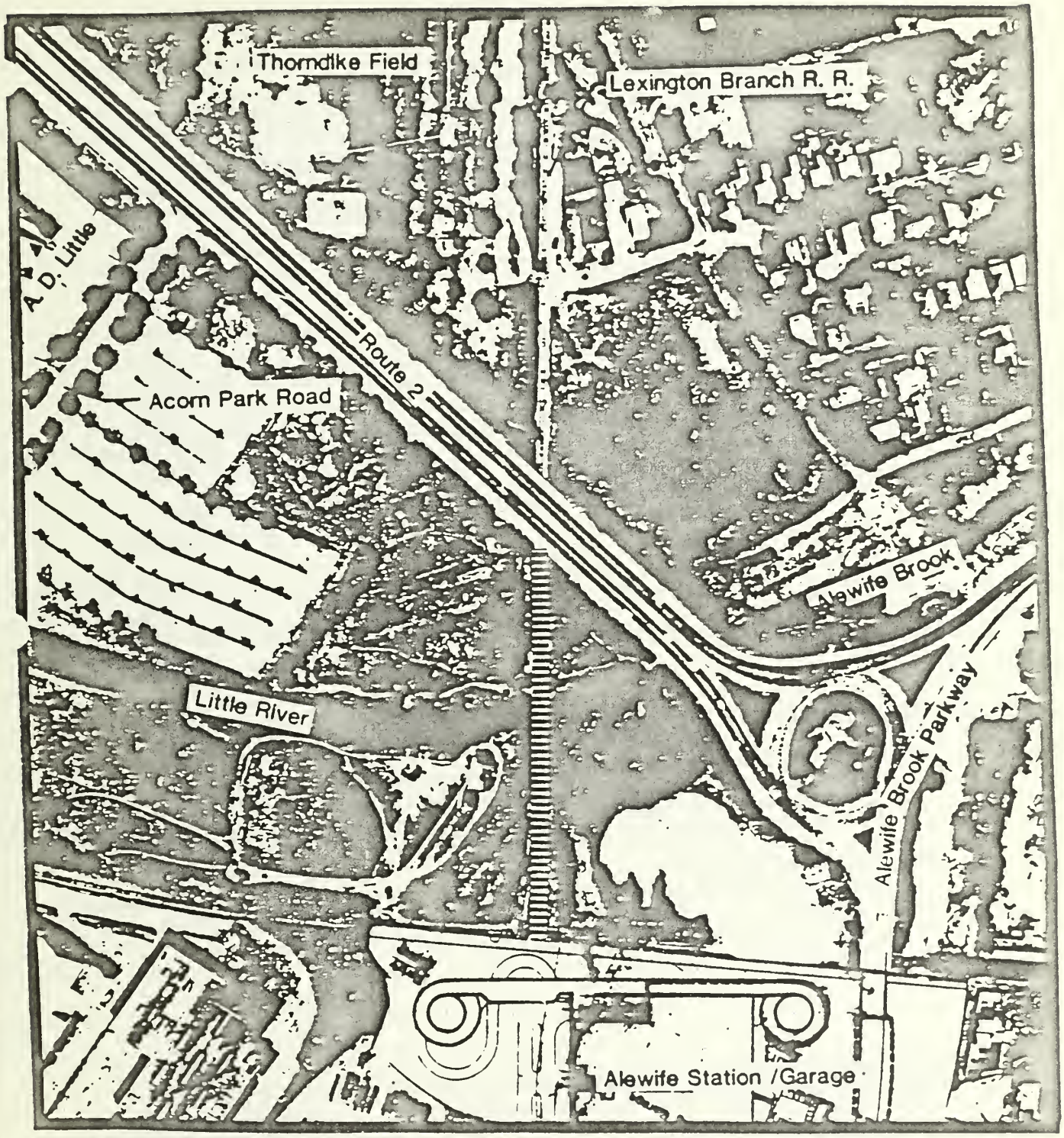
Scale 1" - 200'



OPTION #1

IIIIIIII Proposed Interim Access

SKETCH #2



OPTION #2

Proposed Interim Access

SKETCH #3

E. Has this project been filed with EOEA before? Yes _____ No X
If Yes, EOEA No. _____ EOEA Action? _____

F. Does this project fall under the jurisdiction of NEPA? Yes _____ No X
If Yes, which Federal Agency? _____ NEPA Status? _____

G. List the State or Federal agencies from which permits will be sought:

Agency Name	Type of Permit
Army Corps of Engineers	
MDC	
MDPW	
Cambridge Conservation Commission	
Arlington Conservation Commission	

H. Will an Order of Conditions be required under the provisions of the Wetlands Protection Act (Chap. 131, Section 40)?
Yes X No _____
DEQE File No., if applicable: _____

I. List the agencies from which the proponent will seek financial assistance for this project:

Agency Name	Funding Amount
MBTA	$1,000,000 State Bond Fund

II. PROJECT DESCRIPTION

A. Include an original 8½ x 11 inch or larger section of the most recent U.S.G.S. 1:24,000 scale topographic map with the project area location and boundaries clearly shown. Include multiple maps if necessary for large projects. Include other maps, diagrams or aerial photos if the project cannot be clearly shown at U.S.G.S. scale. If available, attach a plan sketch of the proposed project.

B. State total area of project: 1 to 2.5 acres
Estimate the number of acres (to the nearest 1/10 acre) directly affected that are currently:

1. Developed	0.8 to 1.8 acres	4. Floodplain	1.0 to 2.5 acres
2. Open Space/Woodlands/Recreation	0 acres	5. Coastal Area	0 acres
3. Wetlands	0.2 to 0.7 acres	6. Productive Resources	
		Agriculture	0 acres
		Forestry	0 acres
		Mineral Products	0 acres

C. Provide the following dimensions, if applicable:
Length in miles 0.1 to 0.3 Number of Housing Units N/A Number of Stories N/A

	Existing	Immediate Increase Due to Project
Number of Parking Spaces	0	0
Vehicle Trips to Project Site	5,000 ±	0
Estimated Vehicle Trips past project site	60,000 ±	0

D. If the proposed project will require any permit for access to local or state highways, please attach a sketch showing the location of the proposed driveway(s) in relation to the highway and to the general development plan; identifying all local and state highways abutting the development ; and indicating the number of lanes, pavement width, median strips and adjacent driveways on each abutting highway, and indicating the

III. ASSESSMENT OF POTENTIAL ADVERSE ENVIRONMENTAL IMPACTS

Instructions: Consider direct and indirect adverse impacts, including those arising from general construction and operations. For every answer explain why significant adverse impact is considered likely or unlikely to result.

Also, state the source of information or other basis for the answers supplied. If the source of the information, in part or in full, is not listed in the ENF, the preparing officer will be assumed to be the source of the information. Such environmental information should be acquired at least in part by field inspection.

A. Open Space and Recreation

1. Might the project affect the condition, use or access to any open space and/or recreation area?
   Yes X No _____

Explanation and Source:

While the degree of impact will vary depending upon which alignment is selected, it is not expected that the project will significantly impact the Alewife Reservation area in that the roadway will be either substantially within the existing Lexington Branch Railroad ROW or across on existing paved parking area and roadway. Any impacts will be temporary due to the interim nature of the project.

B. Historic Resources

1. Might any site or structure of historic significance be affected by the project? Yes _____ No X

Explanation and Source:

None have been identified. Source: Environmental Impact Statement Red Line Extension/Harvard Square to Arlington Heights, August 1977

2. Might any archaeological site be affected by the project? Yes _____ No X

Explanation and Source:

None have been identified. Source: See III B 1

C. Ecological Effects

1. Might the project significantly affect fisheries or wildlife, especially any rare or endangered species?
   Yes X No _____

Explanation and Source:

The marine species which could potentially be affected by the project is the alewife, a North Atlantic fish closely related to the herring. The project may also impact songbirds and small mammals for which the potential area of impact in the Alewife Brook Reservation serves as a marginal habitat.

Source: See III B 1

2. Might the project significantly affect vegetation, especially any rare or endangered species of plant?
Yes _____ No X
(Estimate approximate number of mature trees to be removed: 0)

Explanation and Source:

There are no rare or endangered species. The affected area does not contain mature trees. Source: Site visit - Red Line NW EIS

3. Might the project alter or affect flood hazard areas, inland or coastal wetlands (e.g., estuaries, marshes, sand dunes and beaches, ponds, streams, rivers, fish runs, or shellfish beds)? Yes X No _____

Explanation and Source:

The area of the project is within the 100-year flood plan as established for the MBTA Alewife work. Filling and grading may be requjred to complete the project.

4. Might the project affect shoreline erosion or accretion at the project site, downstream or in nearby coastal areas? Yes _____ No X

Explanation and Source:

Some soil erosion could take place during construction but this should not be significant.

5. Might the project involve other geologically unstable areas? Yes _____ No X

Explanation and Source:

Red Line Geotechnical Work.

D. Hazardous Substances

1. Might the project involve the use, transportation, storage, release, or disposal of potentially hazardous substances?
Yes _____ No X

Explanation and Source:

None were found in this area during Red Line construction.

Resource Conservation and Use

1. Might the project affect or eliminate land suitable for agricultural or forestry production?
Yes _____ No X
(Describe any present agricultural land use and farm units affected.)

Explanation and Source:

There are no agricultural or forestry lands involved.

2. Might the project directly affect the potential use or extraction of mineral or energy resources (e.g., oil, coal, sand or gravel, ores)? Yes _____ No X

Explanation and Source:

None were found during Red Line construction.

3. Might the operation of the project result in any increased consumption of energy? Yes _____ No X

Explanation and Source:
(If applicable, describe plans for conserving energy resources.)

The project will facilitate use of mass transportation and reduce vehicular congestion in the station area and, as a result, may reduce fuel consumption.

F. Water Quality and Quantity

1. Might the project result in significant changes in drainage patterns? Yes _____ No X

Explanation and Source:

One option, roadway grades will be maintained at about present topography. On the other option, the roadway will be on a trestle-type elevated structure.

2. Might the project result in the introduction of pollutants into any of the following:

(a) Marine Waters ..... Yes _____ No X
(b) Surface Fresh Water Body ..... Yes _____ No X
(c) Ground Water ..... Yes _____ No X

Explain types and quantities of pollutants.

The only possible source would be from roadway drainage. Given the length of road, this is not considered significant.

3. Will the project generate sanitary sewage? Yes _____ No X

If Yes, Quantity: _____ gallons per day

Disposal by: (a) Onsite septic systems ..... Yes _____ No _____
(b) Public sewerage systems ..... Yes _____ No _____
(c) Other means (describe) _____

4. Might the project result in an increase in paved or impervious surfaces over an aquifer recognized as an important present or future source of water supply? Yes _____ No X

Explanation and Source:

There are no known water supply aquifers in the area. Source: See III B 1

5. Is the project in the watershed of any surface water body used as a drinking water supply?
Yes _____ No X

Are there any public or private drinking water wells within a 1/2-mile radius of the proposed project?
Yes _____ No X

Explanation and Source:

There is an existing well in East Arlington. However, tests conducted in the well prior to Red Line construction indicated that the well did not contain potable water.

6. Might the operation of the project result in any increased consumption of water? Yes _____ No X

Approximate consumption _____ gallons per day. Likely water source(s) _____

Explanation and Source:

The operation of a roadway does not require the use of water

7. Does the project involve any dredging? Yes _____ No X

If Yes, indicate:

Quantity of material to be dredged _____
Quality of material to be dredged _____
Proposed method of dredging _____
Proposed disposal sites _____
Proposed season of year for dredging _____

Explanation and Source:

No construction in the Alewife Brook or Little River is anticipated

Air Quality

1. Might the project affect the air quality in the project area or the immediately adjacent area?
Yes X No ____
Describe type and source of any pollution emission from the project site. automobile emissions

The project is surrounded by major heavily travelled roadways: Route 2 and Alewfe Brook Parkway. The project may reduce traffic congestion at Alewife Brook Parkway and Rindge Avenue, thereby reducing concentrations of carbon monoxide.

2. Are there any sensitive receptors (e.g., hospitals, schools, residential areas) which would be affected by any pollution emissions caused by the project, including construction dust? Yes ____ No X

Explanation and Source:

The nearest residential area northeast of the project in East Arlington is separated from the project by Route 2.

3. Will access to the project area be primarily by automobile? Yes X No ____
Describe any special provisions now planned for pedestrian access, carpooling, buses and other mass transit.

The project is a roadway improvement and as such will involve travel by automobile. Buses travelling to and from the transit station will also use the roadway. Pedestrian and bicycle connections between the transit station, East Arlington and the Arthur D. Little area will also be considered as part of the project.

H. Noise

1. Might the project result in the generation of noise? Yes X No ____

Explanation and Source:
(Include any source of noise during construction or operation, e.g., engine exhaust, pile driving, traffic.)

No pile driving is anticipated. The structures required will be supported by the already constructed Red Line tunnel. Construction noise should be limited to heavy equipment operations. Although traffic noise will emanate from the road, it is negated by the heavily travelled Route 2 and Alewife Brook Parkway.

2. Are there any sensitive receptors (e.g., hospitals, schools, residential areas) which would be affected by any noise caused by the project? Yes ____ No X

Explanation and Source:

The nearest residential area northeast of the project in East Arlington is separated from the project by Route 2.

I. Solid Waste

1. Might the project generate solid waste? Yes _____ No X

Explanation and Source:
(Estimate types and approximate amounts of waste materials generated, e.g., industrial, domestic, hospital, sewage sludge, construction debris from demolished structures.)

No significant demolition is required.

J. Aesthetics

1. Might the project cause a change in the visual character of the project area or its environs?
Yes X No _____

Explanation and Source:

The roadway will be either along an existing transportation corridor (railroad) and/or over existing parking lot and roadway. The project will involve construction of a surface or elevated roadway.

2. Are there any proposed structures which might be considered incompatible with existing adjacent structures in the vicinity in terms of size, physical proportion and scale, or significant differences in land use?
Yes _____ No X

Explanation and Source:

The only proposed structures are either a low level bridge across the Alewife Brook or an elevated trestle with the highest point the same as the existing Route 2 bridge over the Lexington Branch Railroad.

3. Might the project impair visual access to waterfront or other scenic areas? Yes X No _____

Explanation and Source:

The project may impair views of the Alewife Brook Reservation from the Concord Turnpike and Alewife Brook Parkway.

K. Wind and Shadow

1. Might the project cause wind and shadow impacts on adjacent properties? Yes _____ No X

Explanation and Source:

IV. CONSISTENCY WITH PRESENT PLANNING

A. Describe any known conflicts or inconsistencies with current federal, state and local land use, transportation, open space, recreation and environmental plans and policies. Consult with local or regional planning authorities where appropriate.

The Transportation Plan for the Boston Region includes highway improvements between Lake Street and Fresh Pond Parkway on Route 2 to, among other things, serve the Alewife Station and parking garage. These plans are being developed by the MPDW with anticipated construction in 1987.

The federally approved MBTA Red Line Project scope includes roadway improvements in the immediate vicinity of Alewife Station including reconstruction of the Rindge

(continued on page 10a)

V. FINDINGS AND CERTIFICATION

A. The notice of intent to file this form has been/will be published in the following newspaper(s) :

(Name)	(Date)
Arlington Advocate	9/21/83
Belmont Citizen	9/21/83
Cambridge Chronicle	9/21/83

B. This form has been circulated to all agencies and persons as required by Appendix B.

9/15/83
Date

Signature of Responsible Officer or Project Proponent

for Francis M. Keville
Name (print or type)

Address MBTA - 50 High Street
Boston, MA 02110

Telephone Number 722-3116

9/15/83
Date

Signature of person preparing ENF (if different from above)

Donald J. Kidston
Name (print or type)

Address MBTA - 50 High Street
Boston, MA 02110

Telephone Number 722-3152

Avenue and Alewife Brook Parkway intersections. These roadway improvements will provide for station access via Alewife Brook Parkway.

Alewife Station and Garage have been designed and are being constructed to accommodate primary access via direct ramps to the Concord Turnpike in accordance with the most recent MDPW plans.

Although the station can function without benefit of the direct ramps, it is anticipated that there will be considerable traffic congestion in the station area.

The provision of direct access/egress between Alewife Station and the Concord Turnpike (Route 2) will substantially improve station operations and contribute to reduced traffic congestion at the Rindge Avenue-Alewife Brook Parkway intersection.

The proposed temporary roadway is consistent with the Transportation Plan for the Boston Region. Design of the short term access improvements will be closely coordinated with MDPW to assure compatability with their Route 2 project.

2. MEPA Certificate on ENF

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

MICHAEL S. DUKAKIS
GOVERNOR

JAMES S. HOYTE
SECRETARY

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS

ON

ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME: Alewife Short-Term Roadway Improvements

PROJECT LOCATION: Cambridge

EOEA NUMBER: 4931

PROJECT PROPONENT: September 23, 1983

DATE NOTICED IN MONITOR:

Pursuant to M.G.L., Chapter 30, Section 62A and Sections 10.04(1) and 10.04(9) of the Regulations Governing the Implementation of the Massachusetts Environmental Policy Act, I hereby determine that the above referenced project does require the preparation of an Environmental Impact Report.

See attached scope.

October 24, 1983
Date

JAMES S. HOYTE, SECRETARY

FORM A

SCOPE FOR THE ENVIRONMENTAL IMPACT REPORT : EOEA # 4931
ALEWIFE MBTA STATION SHORT-TERM ROUTE 2 ROADWAYS

This project is different and separate from the Long-Range Route 2 ramps and Flyunder proposal which is the responsibility of the Department of Public Works. The Short-Term MBTA ramps are intended to provide short-term relief for traffic congestion in the vicinity of the MBTA station.

This project is one of several in the Alewife vicinity, and builds on the analysis provided in previous EIRs. In particular, the recent Final EIR for the Alewife Triangle (Spaulding and Slye project) is very relevant, because the scope called for consideration of impacts and access alternatives for the near term condition, prior to the completion of the mass DPW major roadways project.

While the ENF was under review, the MBTA notified this office of three items in its construction schedule for the Red Line Garage: (i) Rindge Avenue/Alewife intersection reconstruction, (ii) modified access to the garage from Rindge Avenue extension, and (iii) filling in the Alewife bridge over the freight cut-off. Items (i) and (ii) have been carefully considered and determined not to significantly increase the environmental consequences of the Red Line project EOEA 02082, and may proceed without further environmental review by this office.

Item (iii) is a different matter. The filling in of the overpass is a significant project change. It restricts the range of potential access options, leads to widening of a portion of Alewife Brook Parkway, and may have ramifications for the long-term modifications under study by MDPW, EOEA 4539.

Absent other information, I would be disinclined to let the filling in of the overpass proceed at this time. However, based upon consultation and staff inspections, I am satisfied that an emergency situation exists. The bridge has a truck limitation on it now. It is inspected weekly by MDC. It is structurally deficient, and may be dangerous. The MBTA can proceed forthwith to stabilize the structure, in the cheapest way possible. Modification of the plan, to permit retention of the underpass, would delay stabilization by months. I am not willing to assume that risk.

Therefore, pursuant to 301 CMR 10.09 I find that conditions exist warranting the immediate commencement of the project to fill in the underpass. However, that action shall be fully described in the EIR scoped today. Should it entail placing of any fill in the 100-year floodplain, compensatory storage must be identified. As set forth below, at least one interim access alternative which does not cross MDC parkland must be evaluated in the EIR. If that alternative entails a freight cut-off route, the added cost of the reopening of the underpass should not weigh in the balance against the selection of that alternative.

Finally, I make this determination upon assurances from the MBTA that the financing of the three interim items willnot deplete funds allocated for landscaping, pedestrian and bicycle amenities. I understand that sufficient funds remain such that these functions plus restoration of the disturbed parkland, can all occur.

ALTERNATIVES

The following alternatives should be studied:

1. The Existing or No-Build condition
2. An at-grade S-shaped roadway connection between the MBTA garage and the Arthur D. Little Access road to Route 2.
3. A straight ramp structure from the MBTA garage connecting to the existing Route 2 bridge over the old Lexington/ Bedford branch railroad.
4. A fourth alternative, to be developed, which does not impact parkland and avoids signalized access onto Route 2.

The no-build condition should be studied in light of prior MBTA conclusions that existing access would suffice. At what point does (or did) this assumption become obsolete? Is phased opening of the garage, with careful monitoring of traffic conditions, a reasonable planning strategy?

Alternatives 2 and 3, presented in the ENF involve crossings of Little River, either physical or visual impacts on wetlands, and a signalized stop-light on Route 2. If safety or environmental concerns are raised about these alternatives, no alternative except the No-Build was presented. The MBTA, in seeking to resolve a deteriorating bridge problem and allow bus access to the new Alewife station, may also be cutting out a major option for short-term access improvements.

Furthermore, if there are delays in the long-term Route 2 improvements planned by the Mass. DPW, any "short-term" improvements may be required to last for a decade or more. If there are no practical short-term alternatives and a delayed long-term project, the "No-Build" condition will prevail for many years in the future.

Therefore, the MBTA should also develop a fourth alternative which does not involve a crossing of Alewife Brook or Yates Pond, impacts no MDC land, and avoids signalized access on Route 2. One option in this case is to provide two new lanes of travel underneath Alewife Brook Parkway utilizing large twin galvanized culvert pipes sufficient to provide 15-ft. clearance. Construction staging issues, including traffic, cost and the use of Bailey Bridges, should be included. Traffic would enter the Parkway near Whittemore Avenue at a signalized intersection.

IMPACTS FROM CONSTRUCTION

The EIR should consider the effects of each alternative on wetlands, flooding and traffic detours.

1. WETLANDS AND FLOODING

The area of MDC parkland disturbed by the MBTA construction has been greater than many observers expected. The effects of all alternatives on permanently altering or temporarily delaying restoration of wetlands should be described. Mitigation proposals should be described, including replacement of all lost wetlands functions. The high water areas for the flood of record (1955) should be mapped from Little Pond to Mass. Avenue, using available data. Similarly, estimated 100-year flood levels should be mapped for current conditions given the changed runoff and Mystic River channel/pumping situation. Wherever incomplete or conflicting data is found, it should be clearly presented and explained. The amount and effect of filling or excavation for any of the Build alternatives should be estimated, including the filling under the freight cut-off bridge. The effectiveness of mitigation should be assessed.

2. TRAFFIC DETOURS OR DELAYS

Each alternative should be evaluated in terms of any construction staging and effects on either Route 2 or Alewife Brook Parkway traffic. Allowance should be made for any construction equipment which would be required to work in the road or on a bridge.

3. MDC PARKLANDS

The impacts on MDC Parklands should be carefully studied, because of the vulnerability of these MDC lands to constant encroachment by development and transportation construction. The Little River MDC lands are a remarkable wild resource in such a developed metropolitan area, and the continued incremental losses should not be allowed as a general policy objective. Any encroachment by transportation or development is allowable only if there is a major and substantial effort to avoid or reduce parkland impacts and also if there parkland additions or restorations which are significant and beyond the ability of the MDC to achieve without takings.

The visual effect of the roadways should be shown in either an artist's sketch or a photographic overlay. Commitments to landscaping should be indicated.

TRAFFIC OPERATIONS

The ability of the various alternative to handle traffic congestion as well as to affect alternate-route local street travel should be evaluated, especially as they affect local streets in Arlington, Belmont and Cambridge.

For convenience, the traffic volumes utilized should be based on the 1987 Phase II Build traffic volumes indicated in Fig. VIII-A-1 and 2 of the Final EIR for Cambridgepark (EOEA #4512) prepared for Spaulding and Slye.

Volume/capacity ratios should be calculated for Kindge Avenue, Route 2 Rotary, and any new intersections created for the alternatives. Because there is the possibility of dual-access routes for the Build alternatives (such as using the new access roads for access to Alewife Brook Parkway North rather than the Kindge Avenue bottleneck), flows should be adjusted to reflect reasonably balanced and realistic traffic conditions. A summary table should be prepared showing the Volume/Capacity ratios for those noted above and also including (from EIR #4512) the Concord Avenue/Alewife Rotary, the Massachusetts Avenue/Alewife Brook Parkway intersection, and Lake Street at Route 2.

RELATION TO OTHER PROJECTS

A separate section should indicate how this short-term roadway project sponsored by the MBTA related to other transportation projects in the area, including the Route 2 Mass DPW long-range project and the Lexington/Bedford Branch railroad track replacement project.

Preferably, the EIR should be in one volume, with appendices including the ENF and the Scope, as well as any technical calculations.

3. MEPA Certificate on DEIR

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

MICHAEL S. DUKAKIS
GOVERNOR

JAMES S. HOYTE
SECRETARY

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS

ON THE DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	:	Alewife Station Interim Access
PROJECT LOCATION	:	Arlington and Cambridge
EOEA NUMBER	:	4931
PROJECT PROPONENT	:	M.B.T.A. and E.O.T.C.
DATE NOTICED IN MONITOR	:	April 9, 1984

The Secretary of Environmental Affairs herein issues a statement that the DRAFT Environmental Impact Report on this project does adequately and properly comply with Massachusetts General Laws, Chapter 30, Section 62-62H inclusive, and the regulations implementing MEPA.

The statement which follows highlights a number of problems with the analysis and conclusions in the Draft EIR. The capacities calculated for the various alternatives, as well as the No-Build, require significant revision. Modification of Alternative 3A could significantly improve the AM capacity of that alternative, yielding benefits comparable to Alternative 4 with less impact on the Little River. Non-structural alternatives must be taken seriously and incorporated into any Interim Access plan. Safety of the various alternatives, including existing conditions, requires a far more thorough analysis. Pedestrian access and wetlands mitigation deserves more detailed attention. Ultimately, projected traffic growth outstrips the capacity of any interim improvements. Without a state and local effort to manage growth, traffic crush conditions will become a de facto growth constraint, to the detriment of all. All of these issues, and the appended comments, should be thoroughly dealt with in the Final EIR, so that a sound selection among alternatives may be made.

BACKGROUND

The original 1976 Red Line EIR indicated that new ramps were not required for the MBTA station and garage to function on its initial opening. On page 25 of the Interim Access EIR, this view is reinforced by the statement that the reconstruction of the Rindge Ave./Alewife Brook Parkway intersection would be "adequate for the station and garage alone" until the Mass DPW completes its long-term roadway project. However, traffic generation data in the Interim Access EIR indicates that 1985 MBTA traffic alone would be sufficient to cause AM peak hour capacity to be exceeded by 20% at Rindge Ave., with no development growth. The FEIR should explain and present calculations indicating whether or not interim access improvements are warranted for MBTA operations alone.

The primary intent of the interim access project is to provide improved access to the MBTA Alewife garage when the new Red Line station and garage are opened in 1985. The secondary purpose is to handle some of the new development traffic which has been stimulated by MBTA and related projects in the area. The plans are to improve the handling of interim period traffic during the period 1985 to 1990 and possibly beyond, with the chance that in the early 1990s there will be more extensive "long-term" road modifications implemented by the Mass. Department of Public Works and the Federal Highway Administration.

The original ENF for the Interim Access presented two alternatives, now numbered #1 and #2 in the Draft EIR. In response to the requirement of the scope and to suggestions from the Alewife Transportation Advisory Committee, the number of alternatives was increased by two. Alternative 3 and 3A both utilized the old haul road as an underpass of the Parkway. Alternatives 3A and 4 shared a new signalized intersection design at the Route 2 rotary, but Alternative 4 had an additional inbound ramp entering the garage from Route 2. Thus Alternative 4 was a combination of several features of alternative 1,2 and 3A.

The ramps for Alternatives #1 and #2 were originally planned to be reversible, but the Committee and EOTC agreed that such operations were unwise or infeasible from a safety viewpoint. Both alternatives were modified to be one-lane each way at all times. Alternatives 3 & 3A have not been similarly modified, and still function primarily to serve traffic leaving the garage area in the afternoon.

Because the primary intent of the project is to deal with traffic congestion and because there are numerous business and neighborhood concerns regarding the traffic impacts of new roads and development in the ALewife area, the first requirement of the EIR and the review process must be to establish with reasonable accuracy the likely traffic consequences of taking or not taking various actions in the Alewife area. These actions will have implications for parklands, wetlands and flooding, and for safety as well.

TRAFFIC GROWTH :

Generally, the Draft EIR does a satisfactory job of estimating traffic growth from both the MBTA activities and the Alewife area development expected for 1987. The effect of the MBTA station is to generate 5200 daily trips, with 40% of these being existing traffic which is "intercepted" and removed from routes such as Fresh Pond Parkway. Thus the MBTA station will bring into the area 3,120 new daily trips, while by 1987 new development will generate 11,100 trips. For comparison, Alewife Brook Parkway now carries about 50,000 cars daily. The MBTA trips tend to be concentrated more in the peak hour and to be oriented towards Route 2. How does the peak hour traffic generation from the MBTA station compare to peak hour development traffic?

New development and resulting traffic growth are major issues at Alewife. Although the Mugar development in Arlington has fulfilled its MEPA requirements, the Interim Access EIR does not include any allowance for Mugar by 1987. Overall, the EIR analysis assumes over 1 million s.f. of new office development plus 150 hotel rooms by 1987, but an important assumption is that there is no increase in background traffic <u>through</u> Alewife -- despite considerable new development in other areas of Cambridge and Boston.

The EIR does not attempt to assess impacts beyond 1987. However, it is realistic to assume that interim access may be required to function into the 1988-1990 period as well, and possibly beyond. Ultimate development in the area has been projected by the City of Cambridge as an additional 2.75 million s.f. over 20 years, including 600 hotel rooms. The original City of Cambridge 1979 publicity release, "Alewife Revitalization-- Urban Design Study Phase II" (commonly referred to as the "Fish Book") projected an additional 48,000 vehicle trips from the new development and 18,000 new permanent jobs, which corresponds to a total increase of 4.3 million s.f. Thus Cambridge projections indicate that ultimate development would be four times the development utilized in the Interim Access EIR. Stated another way, the 1987 development growth represents only 1/4 of the ultimate growth projected by Cambridge. These development traffic issues are critical in terms of understanding the effectiveness of the interim road proposals and the ability of the street and parkway systems to handle additional traffic.

The trip generation appears reasonable. However, what were the modal split assumptions utilized for various developments? What is the capability for the Red Line in the short term (1985-1987) to handle additional passengers? What figures were used for existing and future auto-occupancy rates?

TRAFFIC ANALYSIS

Generally, the EIR provides an adequate analysis of signalized intersections. The discussion of the alternative analyses "with triangle" and "without triangle" is initially quite confusing. The intent is to assess the ramps (1) without any "Alewife Triangle" development traffic on the ramps, leaving only traffic to and from the MBTA station, and (2) with Triangle development and MBTA station traffic both on the new ramps. Banning development traffic from the ramps would be difficult to implement, so the Final EIR should emphasize the situation with combined traffic on the ramps -- to clarify matters.

The primary limitation in the DEIR traffic analysis is the failure to deal with the effects of turn blockage, treatment of two-lane left turns, and the handling of rotaries. The latter problem is most severe, because the EIR suggests that present-day traffic volumes exceed capacity by factors of 3 to 4 at the Alewife rotaries, which clearly is not the real-world case. Generally, traffic now moves remarkably well through the rotaries and they are not the traffic flow bottleneck -- the Rindge Ave. signal is the present bottleneck for both morning and afternoon periods. The Final EIR must substantially revamp the analysis of rotary capacity to show proper calibration and thus become more realistic and useful as a prediction method at Alewife. Two recent EIRs (#4849, Methuen and # 4854 Middleborough) contain useful calibrated methodology to assess rotaries. However, at Alewife the heavy traffic volumes result in the traffic moving in groups through the weaving sections, so that an acceptable simulation treats the weaving as a signalized intersection, with the possibility that merging on leaving the rotary may also be the prime constraint. These methods applied to the Alewife rotaries show them to be about 90% of ultimate capacity, which is verified by observation.

(An appendix of traffic calculations, appended to this statement, substantiates my conclusions as to traffic conditions. The Appendix should be reviewed during the revision of traffic capacity calculations.)

The effect of turn blockage was identified during Advisory Committee discussions in response to the observation by Richard Sheridan that traffic volumes at Rindge Avenue exceeded capacity by 25 % for all alternatives in the 1987 AM peak, including the No Build. Such results implied that any of the Build alternatives do not improve bottleneck capacity and thus are quite difficult to justify. These same results are carried through into the Draft EIR, and the same questions apply. Considerations of turn blockage should have been included in the calculations (and must be included in the Final EIR), and this factor will indicate that excess volumes can be reduced from 38% for the No-Build case to 6% for Alternative #4. In other words, alternative #4 does a better job of handling traffic at the Rindge Avenue bottleneck than is indicated by the Draft EIR, and allows for a capacity improvement of about 1/3.

The EIR also includes some questionable handling of signal phasing and turning movements, but overall, the intersection calculations are credible and useful for a Draft EIR.

One significant exception is the afternoon peak hour performance of the new signalized intersection replacing the Route 2 rotary. MBTA officials are aware of problems of the design as shown in the DEIR, which currently has a pair of two-lane movements immediately merging into a 2-lane section during the same signal phase. Traffic demand does not match capacity, as the DEIR claims, but rather may exceed capacity by 40%. The congestion and safety implications of this sudden merging are evident, and the consultants are not considering merging 2 + 1 lanes into either two or three lanes. Such issues have critical capacity and safety implications, and the new intersection (Alternative 4 Modified) must be carefully assessed in the Final EIR for engineering feasibility. The Mass. DPW should be specifically contacted for their comments.

The queuing analysis summarized in Table II-1 appears of limited utility. Why are the afternoon queue lengths the same for all build alternatives at Rindge and Alewife, even though the V/C ratios are quite different? How was a queue length of 64 vehicles estimated for the No-Build case, when the V/C ratio is 1.46?

How were the diversions derived? The similarity of traffic volumes for the AM and PM periods suggests that these diversions were determined independently of the alternatives and their intersection capacity problems.

OVERALL TRAFFIC ASSESSMENT

Some DEIR conclusions warrant adjustment. The EIR implies that the Build alternatives are all similar and no better than the No Build in the morning peak at Rindge Avenue Extension. It also suggests that the rotaries are now and will always be severe bottlenecks at all weaves on all rotaries.

At the Rindge Avenue bottleneck, the Build Alternatives significantly improve operations for both morning and afternoon conditions, and the rotaries operate much more efficiently than claimed. However, the new signalized intersection at the Route 2 rotary is likely to operate much worse than the DEIR indicates, both in terms of capacity and safety. It will probably constitute the new bottleneck for both morning and afternoon peaks. Existing congestion would be worsened unless at least 10 % of the entering traffic diverted to other times or routes (300-500 cars). The diversion would have to be as high as 30% with the currently proposed intersection design.

IN SUMMARY, review and recalculation of the Interim Access EIR analysis for the No Build alternative and for existing Alternative #4 results in the following priority ranking of bottlenecks. For 1987 cases where traffic demand exceeds capacity (100% or more), severe congestion and traffic diversions are likely :

NO-BUILD ROAD ALTERNATIVE		ALTERNATIVE #4	
1987 MORNING PEAK :			
(1) Rindge Ave. Ext/Parkway	138 %	(1) Mass. Ave. + Parkway	120 %
(2) Mass. Ave. + Parkway	120 %	(2) Rt. 2 Rotary Signal	109 %
(3) Route 2 Rotary	106 %	(3) Rindge Ave. Ext.	106 %
(4) Whittemore + Parkway	97 %	(4) Whittemore Ave.	97 %
..... (5) Brighton and Cross St.	89 %	.....	
..... (6) Concord Ave. Rotary	83 %	.....	
..... (7) Rindge Ave. + Parkway	81 %	.....	
1987 AFTERNOON PEAK			
(1) Rindge Ave. Ext/Parkway	166 %	(1) Rt. 2 Rotary Signal	137 %
(2) Mass. Ave. + Parkway	124 %	(2) Mass. Ave. + Parkway	124 %
(3) Route 2 Rotary	115 %	(3) Lake St. EBound Ramps	99 %
(4) Lake St. Eastbound ramps	99 %	(4) Rindge Ave. Ext.	96 %
(5) Brighton and Cross St.	95 %	(5) Brighton and Cross St.	95 %
..... (6) Whittemore + Parkway	92 %	.....	
..... (7) Lake St. Westbound Ramps	87 %	.....	

These results show clearly that despite the best efforts of the transportation engineers and the Alewife Transportation Advisory Committee, the intensity of local traffic growth overwhelms these efforts, and indicates that development schedules and intensity are out of balance with the ability of transportation systems to respond with the methods suggested to date.

IMPROVING THE CONSTRUCTION ALTERNATIVES

Alternative 4 needs considerable attention to the intersection design and the merging of outbound traffic. Ultimately, there may be a requirement to have three lanes leaving the rotary area and heading outbound on Route 2. This action may required slight widening and use of the existing Route 2 breakdown lane as a travel lane.

While Alternatives 3 and 3A do comply with the scoping requirement that at least one alternative avoid crossing Little River/Alewife Brook, the improvements are primarily one-way (outbound from the station) and do not deal with the morning peak flow into the station. This situation could be improved by extending the right turn lane on the Parkway into Rindge Avenue Ext. from its current match with the existing 40-ft. parkway near the old Freight Cut-off Bridge -- to the Route 2 rotary. Thus a continuous right turn lane would be available from the rotary to the MBTA Station, and there would be no turn blockage effect at Rindge Avenue. The traffic results appear to be equal or better than Alternative 4, with lesser impacts on the Little River area. The Final EIR should explore the benefits of this approach.

CONSIDERATION OF NON-STRUCTURAL ALTERNATIVES

The Mystic River Watershed Association has urged that non-structural methods be employed to handle traffic in the Alewife area. A preliminary analysis was prepared for the Final EIR on the Cambridgepark Project (Spaulding and Slye, EOEA #4512) to show the effects of increased carpooling and transit ridership. Unfortunately, the analysis was complex and unclear, and at the time the results did not appear readily useful. Neither was there evident enthusiasm from the various public and private parties who would be essential for successful implementation of any traffic management techniques.

In the interim, there has been a generally successful program of providing alternate travel options as part of the Southeast Expressway reconstruction, and the evidence is preponderant now that development intensity in the Alewife area will overwhelm transportation systems, with and without improvements. Traffic management is no longer a luxury or even an option : for Alewife, it must be seen as a necessity. The initiative of the Mystic River Watershed Association has been responded to in Appendix G of the Draft EIR, with the overall conclusion that there is no pressing need to pursue the special initiatives outlined by MRWA. However, traffic management options provide the only options (short of development controls) which will significantly help the transportation system at Alewife to function. In consideration of traffic problems at Alewife, this approach should be reconsidered and the MBTA/EOTC should prepare a monograph to revise their thinking and approach to reducing vehicle trip generation in the Alewife area during peak periods. This monograph should precede circulation of the Final EIR and should be discussed with the Alewife Transportation Advisory Committee.

FINAL ADJUSTMENT OF TRAFFIC ANALYSIS

All 1987 alternatives show that the Mass. Ave./Alewife Brook Parkway will be overloaded by approximately 20% in the morning and afternoon. Depending on the alternative, other intersections will also be severly overloaded. The real-world result is that trips will be diverted until there is some "tolerable" level of delay or queue. These diversions will take the form of travel at other times, by other routes, ridesharing, transit or simply not making the trip at all. Only when this form of analysis has been logically applied will there be a reasonable chance of predicting traffic impacts on the access to the MBTA station and on local streets in Belmont, Arlington and Cambridge.

If a preferred alternative is selected prior to the Final EIR, this alternative should be analysed for the likely trip diversions which would be necessary for all intersections to function. Demand should be reduced and redistributed until demand, volumes and capacity are equal at the worst bottlenecks. For the purposes of this analysis, development assumptions for 1987 should be kept constant.

The intersection of Brighton and Cross Streets in Belmont appears to be the major controlling flow bottleneck for the Brighton-Blanchard detour route around Alewife. How much more traffic can this route take before intersection congestion is the primary control? Does the EIR analysis allow for the pedestrian signal phase at this signal? How does the analysis of the Concord Avenue/Blanchard Road intersection compare with observations of current peak hour traffic, with the existing traffic signal timing?

Finally, the Mass DPW should be contacted for data on historical traffic growth on Route 2. The Department maintains a permanent counter station on Route 2 near Lake Street, and the historical trends of traffic growth from 1950-1984 should be provided as background information on Alewife growth.

WETLANDS AND FLOODING

Table II-1 shows identical wetlands impacts (3200 s.f.) for both ALternatives 3A and 4, although the latter involves considerably more construction. This issue should be resolved in the Final EIR.

The floodplain map on page V-B does not show the full extent of 100-year flooding. The Final EIR should also include a Figure V-G showing the 100-year elevation for the triangle and MBTA station area. Information from the ADL Draft EIR (EOEA #4957) should be utilized, along with suitable mapping to show the flood plain area and representative flood water depths at proposed ramp locations. Note that the ADL EIR estimated the 1955 flood of record to be a 30-year event, rather than a 100-year storm, with flood elevations of 6.9 USGS. However, the Interim Access EIR indicates the 1955 flood elevations were 7.4 on the USGS datum. The Final EIR should resolve these discrepancies.

Where will the 204,000 to 223,000 c.f of compensatory storage be achieved? What areas of compensatory storage hae already been claimed for the construction of the MBTA station and garage? Plans for such storage must be provided as part of the Final EIR.

PARKLAND IMPACTS

The Little River area is virtually the only area remaining of a vast expanse of freshwater wetlands which centuries ago extended from Fresh Pond to Spy Pond. Filling and alteration have occurred for decades, with the additional creation of clay pit ponds. Little River was relocated once (it used to pass through agricultural land which is currently Acorn Park). Nevertheless, the area remains a vital resource of urban wilds, with the potential for nature walks, canoeing and other passive recreation activities unique among parkland areas in the Boston area. While agencies such as Coastal Zone Management have been created to protect coastal marshes and environmental resources, there is little comparable state or Federal effort to protect inland urban wilderness areas, of which Alewife may be one of the last in the Boston area.

The assessment of parklands mitigation on page 97 is notably inadequate. Any permanent incursion by development or public construction on the Alewife parklands must be taken seriously. The construction of the MBTA tunnel has resulted in temporary construction disruption, but the expectation is that final grading will restore the Little River/Alewife crossing area to approximately its previous condition. Flood compensation has also been provided for. The roadway ramps represent a major and permanent use of MDC parkland, and there should be efforts to mitigate such impacts through the provision of at least equal area and quality of wetlands/parklands to be returned to the MDC to stabilize or increase the Alewife Reservation. For example, the deadended sections of the Freight Cutoff tracks adjacent to the triangle could be transferred to the MDC for parkland/pathway purposes.

The aesthetics of the MDC parkway system must also be considered. The roadways retain considerable potential in addition to existing landscaping and aesthetic value. The interim roadway improvements should be assessed in terms of having long-term potentials for landscaping. Specific provisions should be defined for ways to reinforce parkway values and compensate for pavement widening, in order to avoid the creation of highway aesthetics comparable to Route 1 in Saugus or Route 9 in Framingham.

What specific coordination or suggestions are appropriate relative to the MAPC Open Space Study?

Who owns the land over the Red Line tunnel : MDC or MBTA? Does the MBTA own the old railbed connecting the Bedford Branch with the Freight Cut-off -- including the at-grade crossing of Alewife Brook Parkway?

The boundaries of Thorndike Field should be more carefully shown in Figure V-C.

TRAFFIC DETOURS AND DELAYS

The Interim Access alternatives should be briefly assessed in terms of construction phasing at key bottleneck areas. The reconstruction of the Route 2 rotary will present special problems. However, the removal of the Freight Cut-Off bridge does include a construction strategy to maintain traffic during construction. Similar concepts should be applied to Interim Access options.

SAFETY ISSUES

The issue of safety is mentioned briefly in the EIR (p. 39, p. 63) but there are no figures or analysis. Route 2 is identified as a high accident area, and the rotaries as high accident locations. No substantiating data are offered. Although there has been considerable interest in safety issues over the years, the Alewife area has had only one safety study in recent years : the Arlington Office Park Draft EIR (Mugar, EOEA #4167). This report indicated that for the years 1979-1980, "Only six accidents were reported at the Dewey and Almy traffic circle. All were of a minor property damage nature, and only two occurred during the peak hour period. This probably results from driver familiarity with the location, the absence of lateral friction such as uncontrolled access and parked cars, and the relatively low vehicle speeds due to the relatively high peak hour volumes." (p. IV-A-23) This rotary was laid out in 1933, and as recently as 1970, there were a reported 50+ accidents a year reported. Changes which have occurred since then have been No fault insurance, sidewalks and pedestrian overpass, with median guardrail and other minor road changes. The data now available suggests that the Route 2 rotary is the safest intersection in the area, and that the 1968-vintage Lake Street ramps have a much higher accident incidence.

Because of the public concern over safety and over pressures to increase lane widths, vehicle speeds, and add new traffic signals, the Final EIR should discuss the safety issue as it applies to the interim access alternatives, and the general philosophy of dealing with high-speed Route 2 traffic coming down Belmont Hill which must effect a transition safely down to a 30-MPH MDC Parkway having narrow lanes, pedestrians and urban activity. The accident analysis should look at recent trends in the area in terms of all accidents and injury accidents alone.

The Alternative 3A/4 intersection design at the Route 2 rotary presents special problems for safety analysis. Accidents would tend to be increasingly angle collisions, rather than side-swipe collisions typical of rotaries. Furthermore, access from the Grace parcel to the new ramp is shown, and the potential for wrong-way traffic in the intersection and illegal left turns from Grace to inbound Alewife Brook Parkway should be considered.

From standpoints of both capacity and safety, the Final EIR requires a substantially improved discussion of how the Route 2 Rotary functions. The traditional view, that it is both inefficient and unsafe, cannot be accepted without closer examination.

Improved pedestrian access must also be shown on the interim plans, both for access to Acorn Park and to East Arlington. Each intersection in the study area should be assessed for the volume, adequate and safety of pedestrian crossing movements.

RAILROAD ISSUES

Several of the alternatives include an allowance for the reinstallation of the single commuter rail track along the old Bedford/Lexington route. The current tunnel design includes provision for a single track atop the new tunnel with new roadways located immediately to the west. Will a new bridge structure be required, with additional impacts on Little River? What is the anticipated usage of the track? If usage is limited, could the tracks be included within the roadway structure, rather than on a separate structure and right-of-way?

On page 105, reference is made to the MDC restoring rail track in Lexington. Please explain.

PROJECT SCHEDULING

Will the construction of ramps over the MBTA tunnel require special approvals from UMTA or other Federal officials? Allowance should be made for contract negotiations, UMTA processing, 404 permits, legislative action, etc. It would appear that construction would begin at the earliest in late 1985 and be completed by late 1986. Is this conclusion unduly unrealistic or pessimistic?

DEVELOPMENT INTENSITY

The results of the traffic analysis show that EOTC/MBTA and the Transportation Advisory Committee have done a commendable job dealing with a very difficult transportation issue in a controversial urban area. However, their best efforts do not appear to be sufficient to deal with the large amounts of development projected by the City of Cambridge. The logical conclusion of the traffic analysis is that there must be some very significant moderation of development intensities in the area, on the part of both the development community and the City of Cambridge. Both parties must help in the implementation of effective traffic management programs which can be implemented to reduce the vehicular traffic generated by new development already planned or under construction.

COMMENTS RECEIVED

Numerous comments have been received during the Draft EIR review period. These comments should be responded to in the Final EIR. I note the absence of comments from the Mass. Department of Public Works. Written responses from MDPW should be requested and obtained for the FEIR. Comments from the MDC should also be sought.

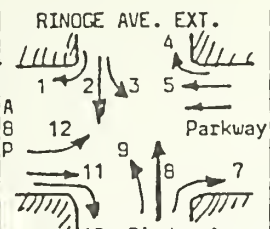
May 11, 1984
DATE

JAMES S. HOYTE, SECRETARY

Alewife Brook Parkway and Rindge Ave. Extension : EXISTING DESIGN

..... AM PEAK ..... AM PEAK ..... AM PEAK .....

2 PHASES	A	B
(7)Turn Angle	o	o
(8)Lane Width	o	o
(9)Grades %	o	o
(10)Bus/Truck%	o	o
(11)Pedestrians	o	o
(12)Seasonal	o	o
Peak Hr.Factor	97	97



EXISTING ROADWAY DESIGN

(S)= 1982 AM Existing
(T)= 1987 AM Plus land development
(U)= 1987 AM Plus MBTA and developmt.

Base Lane Capacity 1800

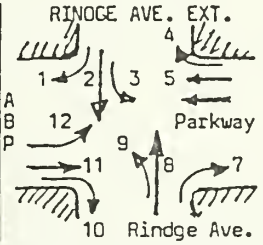
PHASE + MOVE#	VOL. (S)	GEOM ADJ.	7-12 AOJ.	Lane Cap*	# Lanes	CAP% (S)	VOL.CAP% (T)	(T)	VOL.CAP% (U)	(U)
A Lead 12	80	x 1.1	x 1.0 /	1750	x 1 =	5 %	453	28 %	630	40%
A 4,5	2675	x 1.0Sx	1.0 /	1750	x 2 =	80 %	3239	97 %	3836	115%
B 7	265	x 1.1	x 1.0 /	1750	x 1 =	17 %	394	25 %	491	31%
TOTALS :						102 %		150 %		186%
MBTA EIR Calcs :						99 %		148 %		(not calculated)

NOTES :

In the Morning Peak hour, the existing Rindge Ave. signal is the bottleneck, and the steady queues show it to be operating at capacity. Thus for existing 1982 AM conditions, the traffic volumes are 102% and 99% of capacity. The EIR calculations (and these EOEA figures) thus calibrate and check with existing conditions very well -- for signalized intersections. The EIR did not show the effects of MBTA traffic on the existing signal : in effect, MBTA traffic increase is 75% as large as the devel. traffic growth.

..... PM PEAK ..... PM PEAK ..... PM PEAK .....

2 PHASES	A	B
(7)Turn Angle	o	o
(8)Lane Width	o	o
(9)Grades %	o	o
(10)Bus/Truck%	o	o
(11)Pedestrians	o	o
(12)Seasonal	o	o
Peak Hr.Factor	97	97



EXISTING ROADWAY DESIGN

(W)= 1982 PM Existing
(X)= 1987 PM Plus Land Development
(Y)= 1987 PM Plus MBTA and Development

Base Lane Capacity 1800

PHASE + MOVE#	VOL. (W)	GEOM ADJ.	7-12 AOJ.	Lane Cap*	# Lanes	CAP% (W)	VOL.CAP% (X)	(X)	VOL.CAP% (Y)	(Y)
A 10, 11,12	2410	x 1.0Sx	1.0 /	1750	x 2 =	72 %	2434	73 %	2411	72 %
B 7 or 3+8	450	x 1.1	x 1.0 /	1750	x 1 =	28 %	904	57 %	1981	125%
TOTALS :						100 %		130 %		197 %
MBTA EIR Calcs :						103 %		168%		(not calculated)

NOTES :

In the afternoon peak, Rindge Avenue is the primary bottleneck, so the EIR and these EOEA calculations of 103% and 100% agree with existing conditions. For the alternative of No MBTA, the EIR considers a 4-phase signal operation, rather than existing 2-phase. In the afternoon, the MBTA traffic impacts are more significant -- about twice those of development traffic. The cause is the heavy left turn out of Rindge Ave. Extension.

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* Assemble traffic vols., Pk.Hr. Factor
* Determine the phasing, critical moves
* Use the sum of the conflicting turning movements or added phases

TABLE 1 LANE CAPACITY (pass-cars/hr)

PEAK HOUR FACTOR	2-Phase	3-Phase	4-Phase
1.00 (BASE)	1800	1720	1650
.90	1620	1550	1485
.85	1530	1465	1400
.80	1440	1380	1320

TABLE 2 : CAPACITY ADJUSTMENT FACTORS

(1). Straight Lane Utilization == 1.00 for 1 lane
== 1.05 for 2 lanes
== 1.10 for 3 lanes
== 1.15 for 4 lanes

(2). Far-Side or Outlet Bottleneck ("Leverett Circle Effect") == 2.00 when four approach lanes must fit into 2 outlet lanes
== N where N is the ratio of approach lanes to outlet lanes (N > 1.0)

(3). Right Turn == 1.25 (No free turning lane)
== 1.05 (With turning lane)

(4). Single-Lane Left Turn == 1.10 (No turning conflicts)

(5). 2-Lane Left Turn (into 3 lanes) == 1.35 (No flow restrictions)

(6). 2-lane Left Turn (into 2 lanes) == ?.?? Constricted Left turn

(7). Left turns (other than perpendicular) == + 1% per 10 degrees sharper than 90°
- 1% per 10 degrees straighter than 90°

(8). Lane Width == +10% below 10 ft.

(9). Grades == + 1% per 1% upgrade

(10). Bus/Truck == + 1% per 1% BusTruck or + 3% per 1% tractor-trailers

(11). Pedestrians == +10% per 200 peds per hour on turns

(12). Seasonal Variations (increase to get peak traffic at typical intersection in NE. == +10% for Jan,Feb,Jul August counts
+ 5% for Mar, April, Sept.,Dec.
+ 0% for May, June, Oct., Nov.

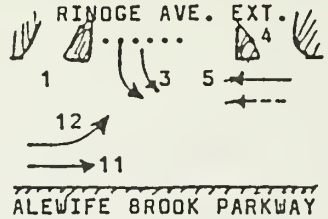
TABLE 3 WHAT V/C RESULTS MEAN .....

V/C	IMPLICATIONS
0.70 + below	No congestion expected
0.80	Congestion very unlikely
0.90	Some delays encountered; some congestion during peak events, bad weather
1.00	Major congestion will be encountered in peak hour
1.10	The entire peak hour may be severely congested.
1.20+ above	Congestion will extend beyond the peak hour unless people travel at other times,use transit

ALEWIFE BROOK PARKWAY + RINDGE AVE. EXT. : New Intersection Alts 1,2,3A

..... AM PEAK ..... AM PEAK ..... AM PEAK .....

3 PHASES	A	B	C	D
(7)Turn Angle	o	o	o	o
(8)Lane Width	o	o	o	o
(9)Grades %	o	o	o	o
(10)Bus/Truck%	o	10	5	o
(11)Pedestrians	o	o	o	o
(12)Seasonal	o	o	o	o
Peak Hr.Factor	97	97	97	97



NEW INTERSECTION DESIGN

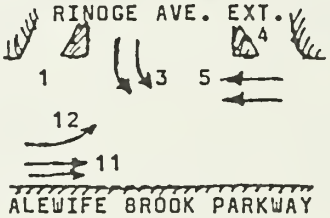
(S)= 1982 AM Traffic
(T)= 1987 AM No-Build plus T and Devel
(U)= 1987 AM Alts 1 + 2
(V)= 198. AM Alts 3A ("with Triangle" traffic on conn. ramps
Base Lane Capacity 1720

PHASE + MOVE#	VOL. (S)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (S)	VOL.CAP% (T) (T)	VOL.CAP% (U) (U)	VOL.CAP% (V) (V)
A 5	2565*x	1.05x	1.0 /	1690 x	2 =	80 %	2452*76 %	2147*67 %	2452*76 %
B 3	80 x	1.35x	1.10/	1690 x	2 =	4 %	439 19 %	439 19 %	(80 (4)%
C 12	80 x	1.1 x	1.05/	1690 x	1 =	5 %	630 43 %	630 43 %	630 43 %
					TOTALS :	89 %	138 %	129 %	123 %
			MBTA EIR Calcs :			93%	125 %	125 %	125 %
					THRU VOL.	2525	1991/369	1991/369	Same as
					RIGHT VOL.	100	1845/140	622/140	No-Build
					RIGHT TURN	40%	25%/ 50%	25%/ 50%	
					BLOCKED	(25)	(461)(70)	(156)(70)	
					EFFECTIVE THRU VOL.	2555	2452/439	2147/439	

NOTES : New intersection design provides about 10% more capacity than existing intersection.
TURN BLOCKAGE occurs for right turns #4 and #1.
car spacing 20'; 120-s.cycle
500'Queue blocks Turn #4
Blocking Vol.= 750 per lane
60' queue blocks Turn #1

..... PM PEAK ..... PM PEAK ..... PM PEAK .....

2 / 3 PHASES	A	B	C	D
(7)Turn Angle	o	o	o	o
(8)Lane Width	o	o	o	o
(9)Grades %	o	o	o	o
(10)Bus/Truck%	o	10	5	o
(11)Pedestrians	o	o	o	o
(12)Seasonal	o	o	o	o
Peak Hr.Factor	97	97	97	97



NEW INTERSECTION DESIGN

(W)= 1982 PM Traffic
(X)= 1987 PM No Build plus T + Devel.
(Y)= 1987 PM Alt 1,2
(Z)= 198. PM Alt. 3A ("with Triangle" traffic on conn. ramps
Base Lane Capacity 1720

PHASE + MOVE#	VOL. (W)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (W)	VOL.CAP% (X) (X)	VOL.CAP% (Y) (Y)	VOL.CAP% (Z) (Z)
A 5	1580 x	1.05x	1.0 /	1690 x	2 =	(49)%	1559 --	1559 --	1559 --
B 3	246 x	1.35x (varies)	1.10/	1750 x	2 =	10 %	2487 102%	1364 52 %	865 32 %
C 12	80 x	1.1 x	1.05/	1690 x	1 =	(5)%	181 --	181 --	181 --
D 11	2610 x	1.05x	1.0 /	1750 x	2 =	78 %	2131 64 %	2131 64 %	2131 64 %
					TOTALS :	88 %	166 %	116 %	96%
			MBTA EIR Calcs :			99 %	146 %	112 %	98 %
			#3	LEFT TURN		230	1981	914	500
			#1	RIGHT TURN		80	562	562	562
				RIGHT TURN		20%	90%	80%	65%
				BLOCKED		(16)	(506)	(450)	(365)
			EFFECTIVE	THRU VOL.		246	2487	1364	865
			"	TURN GEOM.		1.35	1.30	1.22	1.16

NOTES : Additional notes in Appendix 8.
TURN BLOCKAGE occurs as noted above for exiting traffic from Rindge Ave. Ext. (#1 is blocked)

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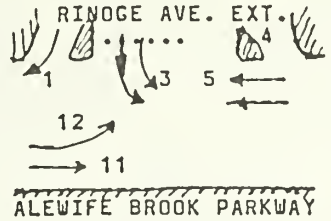
ALEWIFE BROOK PARKWAY + RINDGE AVENUE EXTENSION : New Intersection Alts 3/4

..... AM PEAK ..... AM PEAK ..... AM PEAK .....

3 PHASES	A	B	C	D
(7) Turn Angle	o	o	o	o
(8) Lane Width	o	o	o	o
(9) Grades %	o	o	o	o
(10) Bus/Truck%	o	10	5	o
(11) Pedestrians	o	o	o	o
(12) Seasonal	o	o	o	o
Peak Hr.Factor	97	97	97	97



NEW INTERSECTION DESIGN

(S)= 1987 AM Alt 4 w/
(T)= 1987 AM Alt 3P w/ (added Parkway Lane
(U)= 1987 AM Alt 3R w/ (ramp connection north of Rt.2 rotary
(V)= 1987 AM Alt. 3R+P
Base Lane Capacity 1720

PHASE + MOVE#	VOL. (S)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (S)	VOL.CAP% (T)	VOL.CAP% (U)	VOL.CAP% (V)
A 5	2147*x	1.05x	1.0 /	1750 x	2 =	64 %	1991 60 %	1991 60 %	1991 60 %
B 3	80 x	1.35x	1.10/	1690 x	2 =	(4)%	(90 (4)%	0 0 %	0 0 %
(Ban this turn in AM Peak -- use conn. Rd.)									
C 12	630 x	1.1 x	1.05/	1750 x	1 =	42 %	630 42 %	630 42 %	630 42 %
TOTALS :						106 %	102 %	102 %	102 %
M8TA EIR Calcs:						125 %	--	--	--

NOTES :

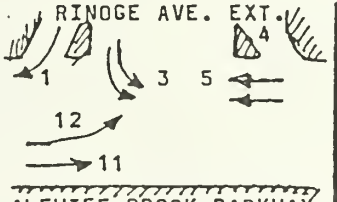
TURN BLOCKAGE occurs for right turn #4
car spacing 20-ft.
120-sec. cycle
500' queue blocks Turn #1
Blocking Vol.=750 Vph/lane

THRU VOL. 1991
RIGHT VOL. 622
RIGHT TURN 25% BLOCKED (156)
EFFECTIVE THRU VOL. 2147*

No TURN Blockage in AM

..... PM PEAK ..... PM PEAK ..... PM PEAK .....

2 / 3 PHASES	A	B	C	D
(7) Turn Angle	o	o	o	o
(8) Lane Width	o	o	o	o
(9) Grades %	o	o	o	o
(10) Bus/Truck%	o	10	5	o
(11) Pedestrians	o	o	o	o
(12) Seasonal	o	o	o	o
Peak Hr.Factor	97	97	97	97



NEW INTERSECTION DESIGN

(W)= 1987 PM Alt 4 w/
(X)= 1987 PM Alt 3P w/ (added Parkway Lane
(Y)= 1987 PM Alt 3R w/ (ramp connection north of Rt.2 rotary
(Z)= 1987 PM Alt. 3R+P
Base Lane Capacity 1720

PHASE + MOVE#	VOL. (W)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (W)	VOL.CAP% (X)	VOL.CAP% (Y)	VOL.CAP% (Z)
A 5	1559 x	1.05x	1.0 /	1690 x	2 =	--	1559 --	1559 --	1559 --
B 3	865+x (varies)	1.16x	1.10/	1750 x	2 =	32 %	865+32 %	865+32 %	865+32 %
C 12	181 x	1.1 x	1.05/	1690 x	1 =	--	181 --	181 --	181 --
D 11	2131 x	1.05x	1.0 /	1750 x	2 =	64 %	2131 64 %	2131 64 %	2131 64 %
TOTALS :						96 %	96 %	96 %	96%
M8TA EIR Calcs :						98 %	--	--	--

NOTES : Additional notes in Appendix 8.

TURN BLOCKAGE occurs as noted above for exiting traffic from Rindge Ave. Ext. (#1 is blocked)
60' queue blocks

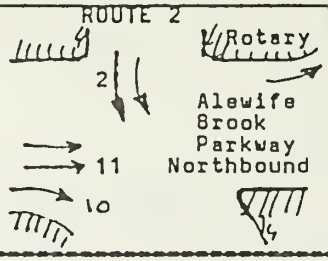
#3	LEFT TURN	500	
#1	RIGHT TURN	562	
	RIGHT TURN BLOCKED	65% (365)	
EFFECTIVE	THRU VOL.	865+	865+ 865+ 865+
"	TURN GEOM.	1.16	Same as first col.

FormVC4 (5/9/84) Calc. by SHK Date 5/9/84 Checked by ... Date ../../..

EXISTING ROUTE 2 ROTARY (Alewife Brook Parkway) WEAVE A -- B

..... AM PEAK ..... AM PEAK ..... AM PEAK .....

2 PHASES A B				
(7)Turn Angle	o	o	o	o
(8)Lane Width	o	o	o	o
(9)Grades %	o	o	o	o
(10)Bus/Truck%	o	o	o	o
(11)Pedestrians	o	o	o	o
(12)Seasonal	o	o	o	o
Peak Hr.Factor	97	97		



EXISTING ROTARY DESIGN

(S)= 1982 AM Existing
(T)= 1987 AM No Build with T and Oevel.
(U)= 1987 AM Alt 1, 2
(V)= 1987 AM Alt 3R+P

Base Lane Capacity 1800

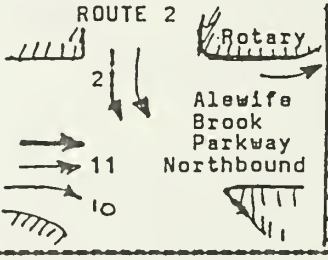
PHASE + MOVE#	VOL. (S)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (S)	VOL.CAP% (T) (T)	VOL.CAP% (U) (U)	VOL.CAP% (V) (V)
A 2	700	x 1.05x	1.0 /	1750 x	2 =	21 %	827 25 %	827 25 %	827 25 %
B 11	1170	x 1.05x	1.0 /	1750 x	2 =	35 %	1382 41 %	1382 41 %	1292 39 %
TOTALS :						56 %	66 %	66 %	64 %
MBTA EIR Calcs:						230%	283 %	283 %	--

NOTES :

The EIR capacity calculations are very inaccurate for analysis of the rotary weaves. The error appears to be typically a factor of 3 or 4. The analysis above treats the rotary effectively as a signalized crossing whose capacity is determined either by cross movements or by merging as vehicles exit the rotary (see Weaving Sections B--C and C--A)

..... PM PEAK ..... PM PEAK ..... PM PEAK .....

2 PHASES A B				
(7)Turn Angle	o	o	o	o
(8)Lane Width	o	o	o	o
(9)Grades %	o	o	o	o
(10)Bus/Truck%	o	o	o	o
(11)Pedestrians	o	o	o	o
(12)Seasonal	o	o	o	o
Peak Hr.Factor	97	97		



EXISTING ROTARY DESIGN

(W)= 1982 PM Existing
(X)= 1987 PM No Build with T and Oevel.
(Y)= 1987 PM Alt 1, 2
(Z)= 1987 PM Alt 3R+P

Base Lane Capacity 1800

PHASE + MOVE#	VOL. (W)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (W)	VOL.CAP% (X) (X)	VOL.CAP% (Y) (Y)	VOL.CAP% (Z) (Z)
A 2	850	x 1.05x	1.0 /	1750 x	2 =	26 %	920 28 %	920 28 %	920 28 %
B 11	2080	x 1.05x	1.0 /	1750 x	2 =	62 %	2860 86 %	1793 54 %	1793 54 %
TOTALS :						89 %	114 %	82 %	82 %
MBTA EIR Calcs:						337%	433 %	307 %	--

NOTES :

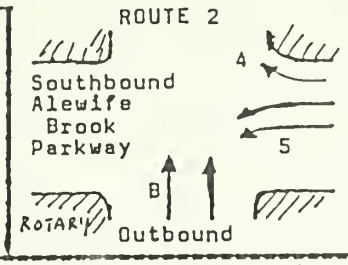
By observation, this weave in the PM peak is the most congested move at the rotary, but does operate slighly below capacity -- by 5-10%. The calculation above thus checks fairly closely, since these observations would imply that the weave is functioning at 90-95% of capacity.
The EIR calculations are way off and of minimal usefulness.

FormVC4 (5/9/84) Calc. by SHK Date 5/9/84 Checked by ... Date ../../..

EXISTING ROUTE 2 ROTARY (Alewife Brook Parkway) WEAVE B -- C

..... AM PEAK ..... AM PEAK ..... AM PEAK .....

2 PHASES	A	B		
(7)Turn Angle	o	o	o	o
(8)Lane Width	o	o	o	o
(9)Grades %	o	o	o	o
(10)Bus/Truck%	o	o	o	o
(11)Pedestrians	o	o	o	o
(12)Seasonal	o	o	o	o
Peak Hr.Factor	97	97		



EXISTING ROTARY DESIGN

(S)= 1982 AM Existing
(T)= 1987 AM No Build with T and Davel.
(U)= 1987 AM Alt 1, 2
(V)= 1987 AM Alt 3R+P

Base Lane Capacity 1800

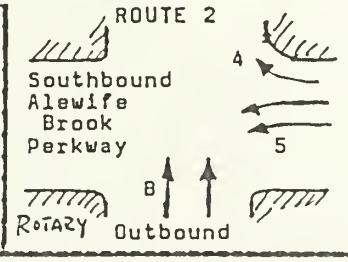
PHASE + MOVE#	VOL. (S)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (S)	VOL.CAP% (T) (T)	VOL.CAP% (U) (U)	VOL.CAP% (V) (V)
A 5	625	x 1.05x	1.0 /	1750 x	2 =	(19)%	1123(34)%	1123(34)%	1123(34)%
B B	1170	x 1.05x	1.0 /	1750 x	2 =	35 %	1382 41 %	1382 41 %	1382 41 %
C 4	1115	x 1.05x	1.0 /	1750 x	2 =	34 %	1181 36 %	1181 36 %	1181 36 %
				TOTALS	:	69 %	77 %	77 %	77 %
				MBTA EIR Calcs:		287%	403 %	403 %	--

NOTES :

The EIR capacity calculations are very inaccurate for analysis of the rotary weaves. The error appears to be typically a factor of 3 or 4. The analysis above treats the rotary effectively as a signalized crossing whose capacity is determined either by cross movements or by merging as vehicles exit the rotary. Some queues do build up in the rotary, because approaching traffic from the Parkway is fast moving and tends to intimidate. Visibility can also be effected by plowed snow or grass growth.

..... PM PEAK ..... PM PEAK ..... PM PEAK .....

2 PHASES	A	B	C	
(7)Turn Angle	o	o	o	o
(8)Lane Width	o	o	o	o
(9)Grades %	o	o	o	o
(10)Bus/Truck%	o	o	o	o
(11)Pedestrians	o	o	o	o
(12)Seasonal	o	o	o	o
Peak Hr.Factor	97	97		



EXISTING ROTARY DESIGN

(W)= 1982 PM Existing
(X)= 1987 PM No Build with T and Devel.
(Y)= 1987 PM Alt 1, 2
(Z)= 1987 PM Alt 3R+P

Base Lane Capacity 1800

PHASE + MOVE#	VOL. (W)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (W)	VOL.CAP% (X) (X)	VOL.CAP% (Y) (Y)	VOL.CAP% (Z) (Z)
A 5	300	x 1.05x	1.0 /	1750 x	2 =	(9)%	439(13)%	439(13)%	439(13)%
B B	2080	x 1.05x	1.0 /	1750 x	2 =	62 %	2860 86 %	1793 54 %	1793 54 %
C 4	850	x 1.05x	1.0 /	1750 x	2 =	26 %	964 29 %	964 29 %	2091*63 %
				TOTALS	:	89 %	115 %	83 %	117 %
				MBTA EIR Calcs:		219%	292 %	251 %	--

NOTES :

By observation, this waave in tha PM paak doas create soma quauing problams in the rotary, much moraso than in the morning paak. Tha calculation above thus chacks fairly closaly.

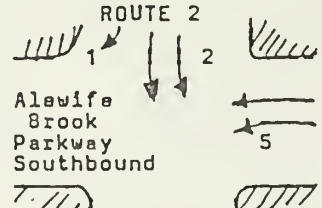
The EIR calculations ara not useful.

FormVC4 (5/9/84) Calc. by SHK Date 5/9/84 Checked by ... Data ../../..

EXISTING ROUTE 2 ROTARY (Alewife Brook Parkway) WEAVE C -- A

..... AM PEAK ..... AM PEAK ..... AM PEAK .....

2 PHASES	A	B	C	
(7)Turn Angle	o	o	o	o
(8)Lane Width	o	o	o	o
(9)Grades %	o	o	o	o
(10)Bus/Truck%	o	o	o	o
(11)Pedestrians	o	o	o	o
(12)Seasonal	o	o	o	o
Peak Hr.Factor	97	97		



EXISTING ROTARY DESIGN

(S)= 1982 AM Existing
(T)= 1987 AM No Build with T and Devel.
(U)= 1987 AM Alt 1, 2
(V)= 1987 AM Alt 3R+P

Base Lane Capacity 1800

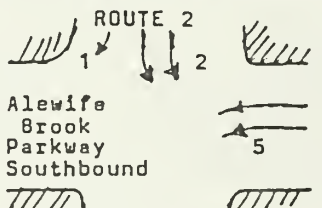
PHASE + MOVE#	VOL. (S)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (S)	VOL.CAP% (T) (T)	VOL.CAP% (U) (U)	VOL.CAP% (V) (V)
A 2	700	x 1.05x	1.0 /	1750 x	2 =	(21)%	827(25)%	827(25)%	827(25)%
B 5	625	x 1.05x	1.0 /	1750 x	2 =	19 %	1123 34 %	1123 34 %	1123 34 %
C 1	2000	x 1.05x	1.0 /	1750 x	2 =	60 %	2728 82 %	1490 45 %	2713 81 %
				TOTALS :		79 %	106 %	79 %	107 %
				M81A EIR Calcs:		370 %	506 %	372 %	--

NOTES :

The EIR capacity calculations are very inaccurate for analysis of the rotary, with errors up to a factor of 4.
The analysis above treats the rotary effectively as a signalized crossing whose capacity is determined either by cross movements or by merging as vehicles exit the rotary. For the C -- A weave, the merging movement into Alewife Brook Parkway inbound has the most significant effect.

..... PM PEAK ..... PM PEAK ..... PM PEAK .....

2 PHASES	A	B	C	
(7)Turn Angle	o	o	o	o
(8)Lane Width	o	o	o	o
(9)Grades %	o	o	o	o
(10)Bus/Truck%	o	o	o	o
(11)Pedestrians	o	o	o	o
(12)Seasonal	o	o	o	o
Peak Hr.Factor	97	97	97	



EXISTING ROTARY DESIGN

(W)= 1982 PM Existing
(X)= 1987 PM No Build with T and Devel.
(Y)= 1987 PM Alt 1, 2
(Z)= 1987 PM Alt 3R+P

Base Lane Capacity 1800

PHASE + MOVE#	VOL. (W)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (W)	VOL.CAP% (X) (X)	VOL.CAP% (Y) (Y)	VOL.CAP% (Z) (Z)
A 2	850	x 1.05x	1.0 /	1750 x	2 =	(26)%	920(28)%	920(28)%	920(28)%
B 5	300	x 1.05x	1.0 /	1750 x	2 =	9 %	439 13 %	439 13 %	439 13 %
C 1	1300	x 1.05x	1.0 /	1750 x	2 =	39 %	1443 43 %	1232 37 %	1232 37 %
				TOTALS :		48 %	56 %	50 %	50 %
				M81A EIR Calcs:		217%	269 %	248 %	--

NOTES :

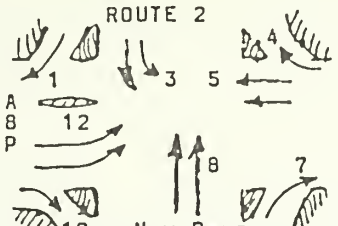
In the afternoon, the C -- A weave and merge do not appear to be a problem. Any congestion is caused by backups from the Rindge Ave. traffic signal.

FormVC4 (5/9/84) Calc. by SHK Date 5/9/84 Checked by ... Date ../../..

NEW SIGNALIZED INTERSECTION AT ROUTE 2 ROTARY + Parkway (Alts. 3A and 4)

AM PEAK ..... AM PEAK ..... AM PEAK

3 PHASES	A	8	C	D
(7)Turn Angle	o	o	o	o
(8)Lane Width	o	o	o	o
(9)Grades %	o	o	o	o
(10)Bus/Truck%	o	o	o	o
(11)Pedestrians	o	o	o	o
(12)Seasonal	o	o	o	o
Peak Hr.Factor	97	97	97	97



NEW INTERSECTION DESIGN

(S)= 1982 AM Traffic
(T)= 1987 AM Alt 3A w/ with T + devel
(U)= 1987 AM Alt 4 w/
(V)= 1987 AM Alt 4 Mod.

Base Lane Capacity 1720

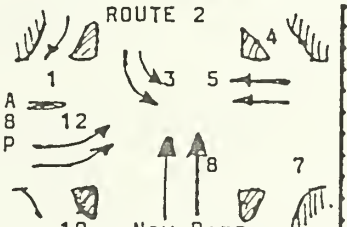
PHASE + MOVE#	VOL. (S)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (S)	VOL.CAP% (T) (T)	VOL.CAP% (U) (U)	VOL.CAP% (V) (V)
A 3	700	x 1.05x	1.0 /	1690 x	2 =	22 %	827 26 %	827 26 %	827 26 %
8 12	1460*	x 1.05x	1.0 /	1690 x	2 =	45 %	1546*48 %	1546*48 %	1546*48 %
C 5	625	x 1.05x	1.0 /	1690 x	2 =	19 %	1123 35 %	1123 35 %	1123 35 %
D 12,8	1170	x 1.05x	1.0 /	1690 x	2 =	(36)%	1422(44)%	1422(44)%	1422(44)%
					TOTALS :	86 %	109 %	109 %	109 %
				M81A EIR Calcs :		--	96 %	96 %	--
				THRU VOL.		1170	1196	1196	1196
				RIGHT TURN		415	499		
				RIGHT TURN		(70%)	(70%)	SAME	SAME
				BLOCKAGE		290	350		
				EFFECTIVE THRU VOL.		1460	1546	1546	1546

NOTES :

TURN BLOCKAGE occurs when outbound Move #12 backs up and blocks off the right turn #10 A 120' queue causes blockage; 120-s.cycle block starts when #12 = 120/20 x 30 x 2 = 360

PM PEAK ..... PM PEAK ..... PM PEAK .....

3 PHASES	A	8	C	D
(7)Turn Angle	o	o	o	o
(8)Lane Width	o	o	o	o
(9)Grades %	o	o	o	o
(10)Bus/Truck%	o	o	o	o
(11)Pedestrians	o	o	o	o
(12)Seasonal	o	o	o	o
Peak Hr.Factor	97	97	97	97



NEW INTERSECTION DESIGN

(W)= 1982 PM Traffic
(X)= 1987 PM Alt 3A w/ with T + devel
(Y)= 1987 PM Alt 4 w/
(Z)= 1987 PM Alt 4 Mod.

Base Lane Capacity 1720

PHASE + MOVE#	VOL. (W)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (W)	VOL.CAP% (X) (X)	VOL.CAP% (Y) (Y)	VOL.CAP% (Z) (Z)
A 3	850	x 1.05x	1.0 /	1690 x	2 =	26 %	920 29 %	920 29 %	920 29 %
8 12	2080	x 1.05x	1.0 /	1690 x	2 =	(65)%	1893(59)%	1893(59)%	1893(59)%
C 5	300	x 1.05x	1.0 /	1690 x	2 =	9 %	439 14 %	439 14 %	439 14 %
D 12,8	2080	x 1.05x	1.0 /	1690 x	2 =	65 %	3020 94 %	3020 94 %	3020'72 %
A/C 4	....	x 1.05x	1.0 /	1690 x	2 =	--	--	--	1181(37)%
					TOTALS :	100 %	137 %	137 %	115 %
				M81A EIR Calcs :		--	99 %	99 %	--

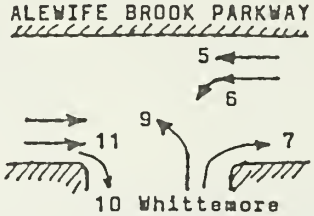
NOTES :

The intersection design for Alt. 4 is modified to permit a merging of the two outbound lanes of the Parkway with 2 lanes from the new ramp, into THREE lanes, rather than TWO shown on the EIR plan. Move #4 must be signalized to allow for the 3-lane outbound move onto Route 2.

FormVC4 (5/9/84) Calc. by SHK Date 5/9/84 Checked by ... Date ../../..

ALEWIFE BROOK PARKWAY + WHITTEMORE AVENUE (Existing Design) All Alts.

3 PHASES	A	B	C	D
(7) Turn Angle	o	o	o	o
(8) Lane Width	10	o	o	o
(9) Grades %	o	o	o	o
(10) Bus/Truck%	o	o	o	o
(11) Pedestrians	o	o	o	o
(12) Seasonal	o	o	o	o
Peak Hr.Factor	97	97	97	97



EXISTING ROADWAY DESIGN

(S)= 1982 AM Existing
(T)= 1987 AM With New Development
(U)= 1982 PM Existing
(V)= 1987 PM With New Development

Base Lane Capacity 1720

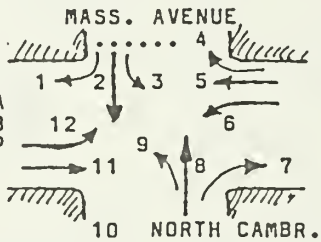
PHASE + MOVE#	VOL. (S)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (S)	VOL.CAP% (T)	VOL.CAP% (U)	VOL.CAP% (V)
A 6	10	x 1.1	x 1.1 /	1690	x 1 =	1 %	73 5 %	0 0 %	15 1 %
B 9	80	x 1.1	x 1.0 /	1690	x 1 =	5 %	1300 11 %	170 11 %	346 23 %
C 10, 11	1105	x 1.05	x 1.0 /	1690	x 2 =	(34)%	1420(45)%	1610 51 %	2172 68 %
A' 5	1670	x 1.05	x 1.1 /	1690	x 2 =	57 %	2378 81 %	980(33)%	1403(48)%
				TOTALS	:	63 %	97 %	62 %	92 %
				MBTA EIR Calcs	:	57 %	84 %	59 %	86 %

NOTES :

Generally good agreement with the Draft EIR. Analysis is based on peak hour operation by either officer or signal control.

MASSACHUSETTS AVENUE and ALEWIFE BROOK PARKWAY (Existing Signal) All Alts.

4 PHASES	A	B	C	D
(7) Turn Angle	o	o	o	o
(8) Lane Width	o	o	o	o
(9) Grades %	o	o	o	o
(10) Bus/Truck%	o	o	o	o
(11) Pedestrians	o	o	o	o
(12) Seasonal	o	o	o	o
Peak Hr.Factor	97	97	97	97



EXISTING ROADWAY DESIGN

(W)= 1982 AM Traffic
(X)= 1987 AM With New Development
(Y)= 1982 PM Traffic
(Z)= 1987 PM With New Development

Base Lane Capacity 1650

PHASE + MOVE#	VOL. (W)	GEOM ADJ.	7-12 ADJ.	Lane Cap*	# Lanes	CAP% (W)	VOL.CAP% (X)	VOL.CAP% (Y)	VOL.CAP% (Z)
A 7,8 1,2	650	x 1.05	x 1.0 /	1600	x 2 =	21 %	715 23 %	750 25 %	750 25 %
B 3,9	280	x 1.1	x 1.0 /	1600	x 1 =	19 %	402 28 %	325 22 %	344 24 %
C 4,5 10,11	1340	x 1.05	x 1.0 /	1600	x 1 =	44 %	1730 57 %	1355 44 %	1858 61 %
D 6,12	180	x 1.1	x 1.0 /	1600	x 1 =	12 %	180 12 %	125 9 %	203 14 %
				TOTALS	:	96 %	120 %	100 %	124 %
				MBTA EIR Calcs	:	93 %	117 %	96 %	119 %

NOTES :

Excellent agreement between Draft EIR and these calculations. For all alternatives, the 1987 morning and evening conditions show traffic demand exceeds capacity by about 20%, making the Mass. Avenue intersection a key bottleneck in the overall Alewife area.

FormVC4 (5/9/84) Calc. by SHK Date 5/9/84 Checked by ... Date ../../..

APPENDIX B

DRAFT ENVIRONMENTAL IMPACT REPORT

MBTA ALEWIFE STATION

INTERIM ACCESS

ARLINGTON AND CAMBRIDGE, MASSACHUSETTS

EOEA #4931

MARCH 1984

This document is available under separate cover.

APPENDIX C

ALEWIFE TRANSPORTATION ADVISORY COMMITTEE

1. Membership List

2. Minutes of April 25, 1984 Meeting
   (Recommendation of Preferred Alternative by ATAC)

3. Minutes of May 15, 1984 Meeting
   (Selection of Preferred Alternative by Secretary Salvucci)

4. Minutes of August 22, 1984 Meeting
   (Discussion by ATAC of Monograph on the Application of Transportation System Management)

1. Membership List

APPENDIX

ALEWIFE TRANSPORTATION
ADVISORY COMMITTEE

TOWN OF ARLINGTON -	Alan McClennon, Jr. Department of Planning and Community Development Town of Arlington Arlington, MA 02174 643-6700
TOWN OF BELMONT -	Thomas P. Callaghan 17 Eliot Road Belmont, MA 02178 484-1917
CITY OF CAMBRIDGE -	Richard Teso Director of Traffic and Parking City of Cambridge City Hall Annex 57 Inman Street Cambridge, MA 02139 498-9042 Alt: Dick Easler
BUSINESS ORGANIZATION -	Albert O. Wilson, Jr. Alewife Businessman's Association A. O. Wilson Structural Co. 40 Place Street Cambridge, MA 02138 547-2450
ENVIRONMENTAL ORGANIZATION -	Herbert M. Meyer Mystic River Watershed Association 276 Massachusetts Avneue Arlington, MA 02174 643-2157
LEGISLATIVE APPOINTMENT - ARLINGTON	Joseph P. Carabello, Jr. 156 Lake Street Arlington, MA 02174 646-5266 Alt: Elsie C. Fiore 58 Mott Street Arlington, MA 02174 648-0077

LEGISLATIVE APPOINTMENT - BELMONT	Richard Sheridan 235 Channing Road Belmont, MA 02178 484-9133
LEGISLATIVE APPOINTMENT - CAMBRIDGE	Carolyn Mieth 15 Brookford Street Cambridge, MA 02140 451-2100 X146
JRTC -	Marvin Miller Barnes and Jarnis 61 Batterymarch Street Boston, MA 02110 542-6521
MAPC -	Frank E. Baxter 18 Sunset Drive Burlington, MA 01803 862-5038
EOTC -	Linda F. Jonash EOTC 10 Park Plaza Boston, MA 02116 727-2371

2. Minutes of April 25, 1984 Meeting
(Recommendation of Preferred Alternative by ATAC)

MINUTES OF APRIL 25, 1984 ATAC

Corrections/additions to the Minutes of April 4, 1984:

Page 2, 10th paragraph should read: "the 100 year flood plain."

Page 1, 9th paragraph should read: "He ended his presentation noting that they have had many meetings with interested groups including MAPC's Executive Committee . . ."

Corrections to the Minutes of March 14:

Alan McClennen stated: The Town of Arlington did downzone a portion of the Town in anticipation of the Red Line and the development of the Mugar site. His understanding was that projects in Cambridge were not subject to special site plan review; however, he was subsequently informed that Cambridge's PUD provisions did include provisions for site plan review.

L. Jonash opened the meeting by stating its purpose: to have Committee Members review and comment on the Interim Access Draft Environmental Impact Report and to present their recommendations on a preferred alternative. She hoped Committee Members could reach a consensus on a scheme for interim access because the final EIR would need to indicate a preferred alternative. It was determined that each Committee Member be given five minutes to present their comments.

Tom Callaghan began by noting that he had discussed the alternatives with the Belmont Selectmen and that Alternative 4 would be the best choice for Belmont. He noted that Belmont was now receiving tremendous traffic impacts from the area making it necessary to support the Interim Access plans. He indicated that Belmont was very anxious to address the broader traffic issues as part of the Route 2 project EIS, noting that he was particularly interested in there being improved traffic flows through the Rindge Avenue/Alewife Brook Parkway intersection, otherwise traffic will continue to increase in Belmont. He noted that he would also like better traffic projection figures.

Joe Carabello stated that after studying the draft EIR his concerns remained with the increase in traffic the garage will bring to Arlington. He noted that Alternatives 1 and 2 were unacceptable because of the signals on Route 2. He stated that Alternative 4 was his preference because it seemed to deal with the traffic best. Joe stated that further study and discussion between the cities and towns was needed to evaluate the entire area. He noted that Alternate 4 would not totally alleviate traffic problems in the area, but things should be better than without it.

Herbert Meyer questioned if it made sense to build an interim access structure that would not be completed until September 1985 and only be used until 1987 at a cost of over $2.5 million. He noted that he believes it would be advantageous to have the garage opened and monitored for the first weeks and then if anything needs to be done, garage operations could be modified without a capital investment and without impacting the area. He noted that his memorandum of April 4 (attached) in response to D. D'Eramo's March 14 memo indicated this strategy. He also noted that there was
(attached)

no mention or discussion in the EIR of the management techniques under the No-Build/ Garage Management alternative. He noted his dissatisfaction with the issue being relegated to the Appendix without full discussion as part of the no-build alternative.

H. Meyer noted that his support was for the No-Build, stating that the beauty of the non-structural options is that they can be in place until 1987 when work on the permanent improvements will be initiated.

Richard Sheridan rejected Alternatives 1 and 2 because of the potential for the signal causing traffic to back up onto Route 2 and detouring through Belmont. He stated that it was important to look at the traffic numbers and if the alternative did not signficiantly improve traffic then it was a waste of money. He questioned whether traffic analysis substantiated a build option sufficiently. He noted that there was likely a 10-25% error built into the calculation assumptions. Dick indicated his support for Alternate 3A as it would best alleviate the PM peak congestion. He noted the cost of Alternate 1 may not be warranted relative to its traffic benefits. Dick commented that the solution to the traffic problems may be an 8-lane highway between the two bridges on the parkway. This would provide adequate roadway capacity in the immediate area.

Marvin Miller noted that the major considerations in selecting an alternative should be to obtain a road that could be built as soon as possible, at the lowest possible cost with the minimum environmental impacts. He also noted that there was no guarantee that there would be permanent improvements to Route 2, therefore, the Committee should focus on solutions that would handle traffic now and for many years to come. Whatever is put in must be able to function effectively and safely for a long time. He could not support Alternatives 1 or 2 because of the safety factors involved. Alternative 3 handled the PM traffic but did not provide adequately for AM traffic. Alternative 4 was therefore his chosen alternative. Marvin noted that H. Meyer's suggestions on "non-structural" traffic management alternatives were good and that between the actual time the station opened and the interim access was in place it would be wise to institute the management alternatives. The State should, however, proceed with Alternative 4.

Carolyn Mieth noted that Cambridge's comments were as follows: As long as the interim roadway is not considered permanent and its construction will not in any way slow down or impact the schedule of the permanent roadway improvements; and further, in recognition of the serious concerns expressed by the Arlington and Belmont Committee Members with introducing a traffic light on Route 2, Cambridge supports Alternative 4. Carolyn noted that serious environmental questions remain unanswered, such as the adequacy of compensatory storage. She urged the Committee to delve into the environmental issues in more detail. She also noted that Cambridge does share concern with Arlington and Belmont regarding traffic. Carolyn stressed that it was important to address the funding of the Interim Access project and the long-term roadway project. She noted that Alternative 4 would serve as a permanent structure if the funding for the Route 2 project was not realized. Carolyn added that she would like to see some creative solutions developed to address the compensatory storage requirements.

Frank Baxter stated his choice for a preferred scheme was Alternative 4. He noted the non-structural improvements could be applied regardless of the final alternative selected. He stated the non-structural options were not by themselves sufficient. He noted his agreement with other members that the Route 2 signal proposed in Alternates 1 and 2 was unacceptable and that Alternate 3A only addressed part of the problem. Alternate 4 could stand alone for many years if the permanent project becomes delayed. He also noted that there would not be an excessive impact on the

wetlands and reservation in Alternate 4, and that the impacts could be mitigated. He did note that he had some reservations about the cost effectiveness of the inbound ramp.

A. O. Wilson noted that his two priorities in reaching a decision were the safety of the road and the amount of time it would take to build. He noted that the dates planned for completion are not optomistic. He stated that much of the construction would be done off the highway and if the Committee acted quickly, the projected completion dates could be made. He stated that since it had been concluded that a signal light on Route 2 would create safety problems he believed Alternate 4 to be the best choice. He noted that there did appear to be a need for the inbound ramp for AM traffic. He stated that the important thing was to keep the project moving ahead.

Alan McClennen stated that he believes Alternate 4 to be the best solution. He viewed the non-structural alternatives as techniques that could be used by both the private and public sector in combination with any of the alternatives. Alan noted it was incumbent upon the Committee to select the best alternative because of the length of time it would be in operation. He also pointed out that the time schedule for implementation of the permanent Route 2 improvements would likely be five years assuming everything goes well with the environmental process. FST will likely finish preliminary work a year from now. MDPW must then select a new engineer to carry out final design which is typically a year process. The project easily involves two years to design and two years to build, excluding the bidding process. This would then bring the project completion to 1990/1991. Alan stated that the Committee should therefore assume the Interim Access would be in place for at least five years. If Scheme 4 was implemented coupled with the Committee continuing to work on non-structural solutions he believed that the traffic problems could be alleviated.

George Teso noted that his major concern was safety and that he believed Alternate 4 to be the solution. He concurred with other members' objections to the signal on Route 2. He noted that Alternate 4 will partially assist Belmont and Arlington with their traffic problems, however, he stressed that the only real relief will be in the long term, permanent solutions. The interim project must only be interim.

Dick Sheridan then commented that he was concerned about the proposal briefly mentioned in the DEIR to phase construction of Alternate 4. He did not support the concept of first building the inbound ramp and operating it two ways. He further noted that given the consensus the Committee was moving toward, he would support Alternate 4.

Matthew Coogan then commented that there appeared to be a fairly clear consensus among Committee Members for Alternate 4 which he would now take back and report to Secretary Salvucci.

Matt then noted that the Governor is committed financially to completing the permanent solution to Alewife. He noted that his earlier comments concerning the phasing of the long-term project may have mislead people into thinking the state would only build a few parts of the project then walk away. Matt wanted to reiterate that EOTC will absolutely, unequivocally push as soon as possible to get Federal approval for the final plans. He noted that there were many unknowns in getting the full permanent project built but the full support of the Governor as well as that of Secretary Salvucci was there.

Mike Oman and Ed Bates representing MAPC noted that they would like to reiterate the importance of timing and permanency in the project, noting their support for Alternate 4. They also noted that Alternate 4 provided a total transportation benefit to the metropolitan area. Mike Oman noted the importance of optimizing access to the new Alewife Station to enable it to reach its full transportation benefit.

L. Jonash noted that she would like to receive M. Oman's comments on the proposed Alternative 4 in light of the MPAC open space planning efforts. She requested Mike's participating in developing design standards for the Interim Access project which would be in accordance with the open space plan.

E. Fiore objected as a taxpayer to any of the build alternatives stating that the public would be saddled with a white elephant. She also commented that traffic would not improve and that Lake Street traffic would be twice as long, noting that Alternative 4 would serve only those people going to the garage and triangle.

Herbert Meyer again proposed the Committee recommend that the garage first be opened and monitored for a time. Then, based upon actual experience, decide if an interim access roadway is needed. He asked why couldn't the implementation of the roadway be delayed. There did not appear to be a need to rush it. The State should observe first, then build if necessary.

Julia O'Brien from the MDC stated that Alternate 3A had a minimal impact on the Reservation. She noted that a potential problem with it would be the staging of construction at the rotary. She commented that Alternate 4 does address traffic issues for both AM and PM traffic and does provide relief at the Rindge Avenue intersection. Julia indicated some sympathy with implementing Alternate 3A only, however, the MDC was supportive of Alternate 4. She noted the MDC would be looking to a serious discussion of mitigation measures.

There was discussion about developers in the area coming in to speak to the Committee. L. Jonash noted that it would be possible to set aside a meeting for such a presentation.

Al Wilson announced that the Alewife Businessman's Association in conjunction with the Cambridge Community Development Department was holding a meeting to discuss Alewife transportation issues. They had invited representatives from CARAVAN and the MBTA Pass Program office to brief the members on their respective programs. The meeting is scheduled for Thursday, May 17th, 3:30 PM at the offices of Bolt, Beranek and Newman.

Pete Willis from Spaulding and Slye indicated that they were very supportive of and willing to participate in various transportation systems management programs.

Steve Kaiser from MEPA announced that the public comment period on the DEIR was over May 9th. He noted that MEPA would like to issue its response to the draft by May 11th.

Linda Jonash announced that the next Advisory Committee meeting would be devoted primarily to a discussion of the preferred alternative for interim access. Secretary Salvucci would attend to discuss the plan with Committee Members and the next steps in the project would be outlined. Fay, Spofford and Thorndike would attend to briefly present and distribute copies of a technical memorandum outlining the expanded number of alternatives being evaluated for the permanent roadway improvements project. This memorandum would be discussed in detail at the following Advisory Committee meeting on June 6th.

ATTENDENCE

April 25, 1984

NAME	ORGANIZATION
A.O. Wilson	Alewife Businessman's Association
M. Miller	JRTC
F. Baxter	MAPC
G. Teso	City of Cambridge
A. McClennen,Jr.	Arlington
T. Callaghan	Belmont
J. Carabello, Jr.	Arlington
H. Meyer	MRWA
R. Sheridan	Belmont
C. Mieth	Cambridge
R. Easler	Cambridge Comm. Development Dept.
P. Nissenbaum	MRWA
E. Fiore	East Arlington Resident
D. D'Eramo	S&P
T. DiSarcina	Segal/DiSarcina
M. McCarthy	Arthur D. Little, Inc.
F. O'Callaghan	Vanasse/Hangen Associates
W. Rains	Cambridge Cons. Comm.
J. O'Brien	MDC
J. Cedrone	MBTA
R. Azzalina	FS&T
M. Robinson	MBTA
C. Teague	MDPW
D. Vickery	Hines
D. Kidston	MBTA
J. Mieth	Cambridge
S. Kaiser	E.O.Env. Affairs
E. Bates	MAPC
M. Oman	MAPC
C. Walters	Arlington Advocate
P. Willis	Spaulding & Slye
M. Coogan	EOTC
L. Jonash	EOTC
J. Samuelson	EOTC

3. Minutes of May 15, 1984 Meeting
(Selection of Preferred Altenative by Secretary Salvucci

ALEWIFE TRANSPORTATION ADVISORY COMMITTEE MEETING
MAY 15, 1984

Corrections to the minutes of April 25 , 1984 were as follows:

H. Meyer noted that page 1, last paragraph should read "it could not be completed until 1986;" page 2, second paragraph should read "completed," not "initiated;" page 4, paragraph 6 should be changed to read that H. Meyer noted it would be fine to have developers come but that an opportunity should also be given to environmental groups to come and speak.

T. Callaghan noted that his suggestion that developers give a briefing to Committee Members on what they planned to do in the area, endorsed by Steve Kaiser of MEPA had been omitted from the minutes.

Linda Jonash opened the meeting by reviewing the past seven months in terms of the Committee and the target events that led up to the interim solution. She noted that EOTC had been approached by representatives of Arlington, Cambridge and Belmont who expressed concern over present traffic congestion, traffic flowing onto neighborhood streets, and the traffic problems that might occur when the station opened. The concern was generated over the interim period, after the station opened and before the permanent Route 2 improvements were in place.

L. Jonash noted that in response to these concerns, the Governor and Secretary Salvucci decided to look into interim improvements in the area. The Committee was then asked to evaluate the merits of different interim options and to recommend to the Secretary their chosen alternative.

Linda Jonash noted that through intensive work by the Committee and the consulting team, four no build options were developed. These options were then fully analyzed in the Draft Environmental Impact Report (DEIR) which was issued the end of March. The DEIR was presented to numerous groups, and has gone through the 30-day review period. MEPA has issued its comments and concluded that the draft does comply with State environmental guidelines. A final EIR must now be prepared in which a preferred alternative is indicated.

Matt Coogan then recapped the purpose of the meeting -- to announce the decision by Secretary Salvucci to accept the recommendation/consensus reached by the Committee a month ago regarding an interim access solution to the Alewife area.

He noted that Secretary Salvucci and EOTC were strongly committed to seeing a long-term, permanent solution to Route 2 to be undertaken by the Department of Public Works with federal funding.

M. Coogan noted that federally funded projects took a longer time to complete because of the processes involved. He noted that he would like to see the final long-term solutions in place in the next four to five years.

He also noted that in reaching the preferred alternative the Committee had begun with the basic notion of having a driveway in and a driveway out of the station with a signal on Route 2. Through the hard work of the Committee, a more complex solution evolved. Many Committee members had difficulty with a traffic light on Route 2. After further work and analysis, the Alternative 4 solution evolved.

D. D'Eramo of S&P then generally reviewed the design details of the plan, outlining the pedestrian access provisions, the environmental impacts and the traffic implications of Alternative 4. He noted that the goal of the Committee was to minimize the impact on the Alewife Reservation. Alternative 4 avoided any significant impact on the wetlands and Reservation area. He noted that the pedestrian access options designed as of this date are very conceptual and S&P will have more detailed plans in three weeks.

Secretary Salvucci thanked the Committee for their hard work. He then noted that the group was getting together to mark an important point in the participatory process and commented briefly on the history leading up to this decision-making point. He noted that when Governor Dukakis had won the primary Representative Gibson, Senator Backrach and Senator Kraus immediately approached him to question what his approach to the traffic problem at Alewife would be. The Governor then noted that it would be a top priority of his administration to find a solution. The Secretary also noted that the major construction activities associated with the Redline Extension were coming to a close and he felt the traffic disruption caused by the construction at Alewife had bottomed out. Opening the Red Line station and completion of the local roadway improvements as part of the station construction were two important improvements that were going to be seen in the area. Along with these two improvements, the Secretary noted that there needed to be interim improvements as well as a long-term solution. Through the support of the Committee, the interim access improvements would be the third significant step towards improving traffic flows in the area.

The Secretary noted that though Alternative 4 was not what he had originally had in mind when he had begun the process, it does do the job of making another significant improvement in the traffic situation in the area. He also noted that Option 4 avoided major environmental impact in both wetlands and parklands, moves forward for better traffic flows in the area and leaves open the options for the long-term solution that is really needed in the area.

Secretary Salvucci in thanking the Committee for their hard work and consensus asked that they continue to sacrifice their time in working towards long range improvements. He also stressed the need for the Committee to participate in developing the requirements that are necessary in the engineering details such as construction staging and providing compensatory storage for any flood storage area displaced.

A reporter then asked the Secretary what kind of improvement would be seen. The Secretary responded by noting that he believed the (T) station opening would not make traffic worse and indeed may improve the traffic. He anticipated that the combination of interim access and the station opening would be a real benefit to the area and bring it above the status quo.

Another question asked to the Secretary by a reporter was that of safety. In answering the question, the Secretary noted he believed the interim access would improve safety in the area but the interim access's principle advantage would be to reduce congestion in the Alewife area.

When asked by a reporter if the interim access would become permanent because of lack of federal dollars, the Secretary stated that he didn't think so. The Secretary reiterated his commitment to a long-term permanent set of improvements to address the safety, traffic, congestion and access problems at Alewife. He noted that it was important to get the interim solution underway while continuing to work towards a permanent solution.

When questioned as to why it wasn't possible to firm up the long range plans a few years ago to avoid spending the $3 million for interim improvements, Secretary Salvucci stated that the $3 million is not wasted money but is instead a down payment on the long-term permanent solution. He also noted that the interim access was a result of the process and the realization of the problem of getting cars through the area but also respecting the area's boundaries and environmental values.

L. Jonash then noted that it was a consensus of this Committee to implement a very aggressive ride-sharing program in the area and compliment any build options with the no build alternatives such as ride-sharing, vanpool, shuttle buses. She noted EOTC's commitment to work with area developers and surrounding communities in implementing these "no build" alternatives in conjunction with a build alternative.

In responding to a question as to the major concerns expressed by Committee members during the planning process for the interim access project, Linda Jonash noted: reducing traffic detouring on residential streets and developing strategies that would be sensitive to environmental concerns.

Secretary Salvucci then reiterated his strong belief that the (T)station is a solution and not part of the problem in the area. The (T) station should get cars off the road which is a major step towards the solution.

L. Jonash then opened the meeting up to Committee members' comments.

Tom Callaghan, Belmont, reiterated his town's concern over the traffic spilling onto residential streets and it was crucial to remedy the overflow traffic through Belmont by a permanent solution.

H. Meyer then questioned the validity of the traffic projections in the DEIR (see attached memorandum) and suggested that these projections be updated to take into account more realistic building projections for the area. He also stated his belief that no interim roadways should be built but that the station open and see what kind of problems arise, if any, and address them then. He recommended that only the nonstructural alternatives be implemented.

M. Coogan noted that in response to the traffic figures that the garage could open and traffic would work but that it was our job to look ahead.

Secretary Salvucci in addressing H. Meyer's suggestion stated that the interim access should go hand-in-hand with ride-sharing programs, carpools and other no-build alternatives. He noted that the interim access will make things better and the long-term plan will make it even better but that this was the extent of the tools available to EOTC to help with traffic congestion in the area. He then noted his concern that the various cities and towns be sensitive to the level of development that can reasonably be accommodated in the area.

M. Miller then noted that if we are going to relook at traffic figures, it should be done now.

Secretary Salvucci then noted that traffic figures will be important in the long term but that at present the Committee has reached a consensus for the interim access and it should go forward.

A. McClennen noted that H. Meyer raised a good many points but it is important to move forward and not fall into the old trap. Noting that the solution arrived at is very manageable both in time and money, it is important to move forward.

C. Mieth noted that this solution is a regional solution to a regional problem and that the consensus reached is gratifying. She noted that many things still needed to be looked into further such as the relationship to the MAPC Open Space Plan, compensatory storage and traffic flows through the proposed new Dewey Almy intersection.

She also noted that everyone always talks about traffic impacts on Arlington and Belmont neighborhoods and that it was important to keep in mind that all the traffic from these two areas then flows through Cambridge on their way to downtown Boston.

F. Baxter noted that we shouldn't loose sight of the principle concern of traffic management along with environmental concerns. He reiterated that the project should move forward and not slow down. In terms of the traffic projections, F. Baxter noted that he leans toward overestimating the numbers so that the solution arrived at will work over a long period. He then directed the question of the opening of the garage to Secretary Salvucci.

In response to F. Baxter's question, the Secretary noted that no exact date for the garage opening had been arrived at and that he and General Manager O'Leary would look at the progress of the interim access before making a judgment. He also noted that if there was a problem, the garage capacity could be restrained. He also noted that he and J. O'Leary would be looking to the Committee for their suggestions on the opening.

D. Sheridan noted that there was a definite need to refine the traffic numbers and that if the numbers were refined it might be found that the access road might not be necessary.

M. Coogan and Secretary Salvucci reiterated their commitment to seeing the long-term project in place. They noted that they were committed to seeing a right and proper end to Route 2.

J. Carabello noted that the interim access does improve the traffic flows and that overall improvements will have to go on. He noted that development is a major concern to the area and that a final solution must be implemented to improve the entire area.

G. Teso commented that he was pleased to see a consensus and that he just wanted to reiterate that the project should go forward.

E. Fiore expressed her concern over lack of proper addressing of environmental issues in the DEIR. She stressed her belief that the Dewey Almy Circle does work and she does not want to see the interim access alternative implemented. She also noted that she doesn't feel that developers should have roads built for their use.

F. Baxter noted that since the inner belt was killed, the communities effectively became the inner belt and that the problems must be addressed with that fact in mind.

Secretary Salvucci reiterated that he is not redesigning an end to Route 2 or moving the bottleneck further into town but is instead interested in obtaining a graceful transition of Route 2 into the communities to service their needs. He also noted that he is very interested and aware of the environmental concern of both E. Fiore and H. Meyer and is hopeful of solving this problem permanently with a great regard for the environment.

L. Jonash noted that there were many things that still needed to be worked on with Alternative 4 such as additional traffic work, environmental issues regarding compensatory storage, pedestrian access, and legislation for change of use, construction phasing.

L. Jonash then highlighted the next steps in the project and the outstanding issues requiring particular attention. They were:

- response to comments and preparation of final EIR indicating Alternate 4 as the preferred plan;
- obtaining legislation enabling a change of use in MDC property from parkland to transportation uses;
- developing a detailed plan for providing compensatory storage for any flood storage area to be displaced by the project;
- refining the pedestrian access plans;
- developing a mitigation program to address parkland impacts;
- refining the preliminary concept plan for signalization of the Dewey Almy rotary;
- developing a construction phasing plan.

Dean Groves of Fay, Spofford and Thorndike then distributed copies of a technical memorandum outlining the expanded number of design concepts being evaluated as part of the Route 2 improvements project. This memorandum will be presented and discussed at the next Advisory Committee Meeting on June 6th.

Meeting adjourned at 5:20 PM.

MAY 15, 1984

ALEWIFE TRANSPORTATION ADVISORY COMMITTEE MEETING

Carolyn Mieth	Cambridge Appointment
Herbert M. Meyer	Mystic River Watershed Assoc.
Alan McClennen Jr.	Arlington
George Teso	Cambridge
Marvin W. Miller	J.R.T.C.
Joseph P. Carabello Jr.	Arlington
Tom Callaghan	Belmont
Frank E. Baxter	M.A.P.C.
Richard Sheridan	ATAC-Belmont
A.O. Wilson	Alewife Businessman's Assoc.
Frederick Salvucci	EOTC
Matthew A. Coogan	EOTC
Linda Jonash	EOTC
Joseph Kellogg	Cambridge Community Development
Richard Easler	Cambridge Community Development
Paul D. Nissenbaum	M.R.W.A.
Charles Teague	Mass. DPW
Elsie C. Fiore	East Arlington Resident
Catherin Walthers	Arlington Advocate
Michael Shea	EOTC
Bruce Davidson	Globe
Frank Keville	MBTA
Les Moore	Ellenzweig Moore & Assoc.,Inc.
Don Kidston	MBTA
Maggie Robinson	MBTA
Loretta Cedrone	MBTA
Janet Burns	Cambridge Conservation Commission
Julie O'Brien	Planning/MDC
Carol W. Blair	MAPC
Steve Kaiser	Env. Affairs MEPA
Senator Bachrach	State Senate
Representative Gibson	State House of Representatives
Michael McCarthy	Arthur D. Little
Anthony DiSarcina	Segal/DiSarcina Assoc.
Domenic D'Eramo	Sverdrop & Parcel

May 15, 1984

To: Chair & Members, ATAC

From: Mystic River Watershed Association (MRWA), Member

Subj.: Development Projections and Trip Generation

1. The traffic analysis in the DEIR 4931 for the Alewife Station Interim Access, chap. IV.B, derives its traffic volume forecasts from the development program of the Spaulding & Slye EIR 4512 for the CambridgePark. That program is based on pre-1982 assumptions. It is suggested that they be updated to provide reliable trip generation analyses for the Interim Access FEIR, which is scheduled for this summer.

2. According to the Spaulding & Slye EIR, p. III-2, their building #1 is scheduled for 1984 and the total project of three buildings for 1987. The #1 comprises 183,000 square feet (sf.) and the total 670,000 sf. It is noteworthy that the Traffic Projections and Analyses for the Alewife Boulevard by N. A. Abend & Segal/ DiSarcina of April, 1984, use the same floor space figures based on assumptions, which the Cambridge Community Development Department made after consultation with landowners and potential developers; see page 5 of that report.

3. The DEIR 4931 for Interim Access summarizes the development projections in table VI-A on p. 69, which compares the proposes floor space of #4931 with those of the Alewife Boulevard and Spaulding and Slye's DEIR and FEIR. The projections are given for the assumed station opening in 1984 and the highway permanent improvements assumed for 1987. The second line of table VI-A lists the figures for "Triangle-CambridgePark".

4. These pre-1982 development projections appear to be dated by now; e. g., Spaulding #1 scheduled for occupancy in 1984 is not ready. As for his #2 & 3, he went for a variance last month for #2, which means redesign and delay. And the impression is that he wants to see first how the renting of #1 goes. The #2 may well be finshed after the 1987 dead line for the permanent highway improvements. Spaulding intends to monitor the market demand before he continues to construct stepwise building by building. Thus, his completion date for the total project has become open-ended.

Similar considerations pertain to all the other development projects which the table VI-A is listing. Very few, if any of them, will be operational before 1987. All the floor space and room quantities of the table seem to be in need of a realistic re-scheduling by the Cambridge Community Development Department with the help of a fresh consultation with landowners and potential builders.

5. The MBTA may wish to prepare such revised schedule for its FEIS in collaboration with the ATAC. Its traffic consultant will re-analyze his trip generation for 1984 and 1987. The T's interim access consultant will, then, re-evaluate the need for interim alternatives in the light of the updated development program. There is the possibility that any development impact on traffic congestion may become small and remain within the margin of statistical error. The originally optimistic anticipation has given way to a more deliberate pace which appears to have put in question the purpose of interim access to the station and Rindge Avenue Extension.

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ALEWIFE TRANSPORTATION ADVISORY COMMITTEE

MINUTES -- June 6, 1984

Corrections to the minutes of May 15 were as follows:

Thomas Callaghan requested that Secretary Salvucci's quote regarding the proposed ending of Route 2 be given verbatim. The quote is as follows:

> "I am not intending to increase the capacity of Route 2. We need a graceful transition from Route 2 into the communities. I am not interested in moving the present bottleneck to Concord Avenue but rather solving the issue in the area."

Dean Groves and Rodney Plourde of FS&T presented Route 2 design schemes previously reviewed in memorandum dated May 15. Rodney Plourde noted that these schemes are in their early design phase and therefore do not contain bicycle/pedestrian access. He also noted that the analysis is based upon traffic figures generated through other studies. CTPS is now undertaking a comprehensive update of traffic projections for the area.

Scheme A -- No Build

This scheme contains present roadway conditions and roadway improvements under MBTA Contract #602. There would be no additional bicycle/pedestrian access except for those improvements included under Contract #602.

Frank Baxter questioned why the "no-build" scheme did not include the proposed Interim Access improvements.

Linda Jonash responded that until the Interim Access improvements became a formally approved project (i.e., complete Final EIR) the no-build alternative had to reflect existing conditions. When the Interim Access project becomes more definite, the no-build alternative would need to be modified to incorporate it. The State might need to include two "no-build" options in the EIS -- one with interim access and one without it. At a minimum there would need to be an alternative that did not have ramps across the Reservation and that would require removal of any ramp built for interim purposes.

Tom Callaghan questioned why the no-build option -- and all other alternatives -- assumed the Alewife Boulevard project was in place. Tom noted that Belmont had always taken the position that it was segmentation to delete consideration of this project from the Route 2 EIS.

Linda Jonash responded that the MEPA scope specified that Alewife Boulevard was a given for all alternatives.

Steve Kaiser responded that at the time the Route 2 EIS scope was prepared, the Boulevard Project was much more a reality. Now conditions had changed and the status of the project was very uncertain. Steve indicated MEPA may re-evaluate the scope given the changed conditions regarding the Alewife Boulevard and Interim Access projects.

Dick Easler commented that reconstruction of the Truss Bridge should probably be considered part of the no-build option since the State will have to replace the bridge regardless of whether a permanent Route 2 project is approved.

4. Minutes of August 22, 1984 Meeting
(Discussion by ATAC of Monograph on the Application of Transportation System Management)

ALEWIFE TRANSPORTATION ADVISORY COMMITTEE

August 22, 1984

Discussion of:

"Monograph on the Application of Transportation Systems Management Measures as an Element of the MBTA Alewife Station Interim Access Project".

Prepared by Sverdrup & Parcel and Associates, Inc. in association with Segal/DiSarcina Associates dated August 1984.

The Monograph was summarized by D. D'Eramo of Sverdrup & Parcel and Associates.

The following are the comments made by the committee members present.

Richard Easler - Made comments on portions of text. Agrees with Monograph's conclusion.

Carolyn Mieth - Accepts Monograph

Herbert Meyer - Presented attached Memorandum dated August 22, 1984.

A written response to the Memorandum as requested by ATAC is attached.

Marvin Miller - After reading the Monograph, he is more convinced that "build" is the right solution.

Frank Baxter - Agrees with Marvin Miller.

George Teso - Accepts Monograph.

Tom Callaghan - Accepts Monograph.

Not commenting: Al Wilson, Dick Sheridan and Linda Jonash.

Not present: Alan McClennon, Jr.; Joseph P. Carabello, Jr.

Complete minutes of the meeting are available.

August 22, 1984

To: Chair and Members, Alewife Transportation Advisory Committee

From: Mystic River Watershed Association, Member

Subj. Sverdrup Monograph on Transportation System Management Techniques, August 1

The monograph is an effort in the right direction. The MRWA likes to offer a few comments to be discussed on August 22. We assume that the comments by the members will be appended to the forthcoming MBTA FEIR #4931 together with the T's responses to them.

I. ALEWIFE SPECIFICES

The monograph stresses the need to prevent the garage traffic from interfering with the through traffic on the parkway and to reduce congestion at the intersectic with Rindge Avenue Extension (Rindge). It is estimated that almost half of the garage traffic has until now been a part of the through traffic. This fact will relieve some of the morning peak congestion. Some of the TSMT's may have a similar effect. Experience has shown that such reduction of the traffic volume tends to induce commuters who have been reaching downtown by other routes to drive through Alewife.

On the other hand, the Red Line Extension has the objective to relieve traffic and parking congestion in Boston and Cambridge. Thus, the T has no interest to ease the Alewife through traffic. Secretary Salvucci has expressed the same sentime at our meeting of May 15. Consequently, the congestion on the Alewife Brook Parkway serves a specific purpose. Although it is desired that improvements make traffic flow smoother on the parkway, they must not result in more automobiles getting through to downtown. This applies equally for the commuter diversion to the subway, to garage parking, interim and parmanent road constructions, and TSMT's. An advantage of the TSMT is that they can be adjusted to any changing conditions of the future so that the parkway flow gets smooth, but the traffic volume remains the same.The TSMT can be tuned up and down, while that would be costly, slow, disruptive, even unfeasible with structural alternatives.

II. ANALYSIS ASSUMPTIONS UPDATE

Sverdrup uses for the interim access DEIR the 1982 and 1987 traffic volumes of Spaulding & Slye (fig. 2 (S&S IV-A-2) and fig. 14 (S&S VI-A-14), and S&P fig. VI-C and VI-F on next page). Also shown are fig. 8, 12 and 10, which are the S&S figures for the No-Build and Build of 1984, and the No-Build of 1987. We show the morning rush hours only,to conform to the monograph.

The monograph states (p. 2, end of III) that the station operates well if the number of cars turning right into Rindge in the morning is reduced from 1845/hr (fig. F) to about 750. Of the 1845 cars 1000 are parking and 200 are drop-offs. The comparative S&S fig. 14 indicates 1306 cars turning right into Rindge. 700 of them turn into the station, of which 500 park and 200 drop-off. The 1000 cars/hr are an extreme number. The whole garage would be filled in two hours and the garage open for access only from 7 to 9 A.M. Also, this is in contradiction to the monograph statement that"the station operates well" with about 750 cars/hr turning right into Rindge (p. 2).

TRAFFIC VOLUMES AT RIDGE

SPAULDING & SLYE

SVERDRUP & PARCEL

IV-A-2

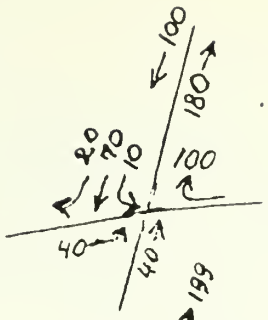


fig. 2

-C 1982 BASE

(same as IV-A-2)

VI-A-8

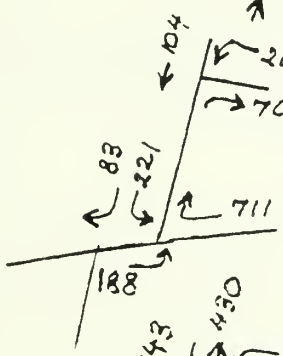


fig. 8

1984 NO BUILD

VI-A-12

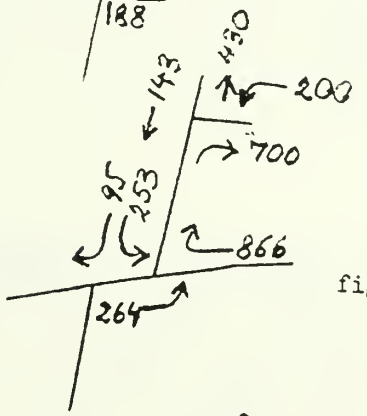


fig. 12

1984 BUILD

VI-A-10

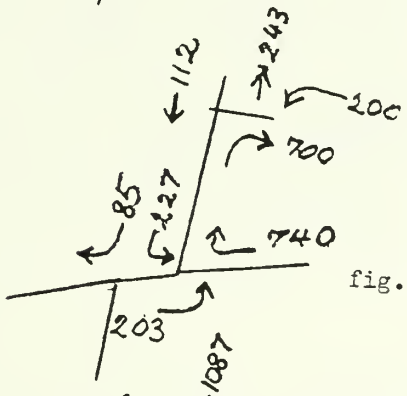
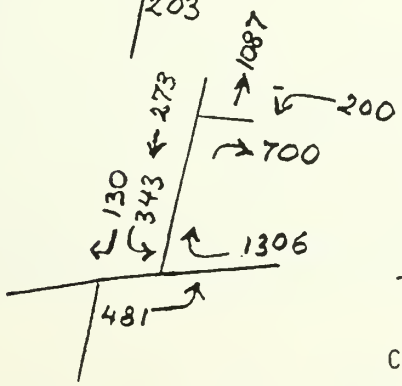


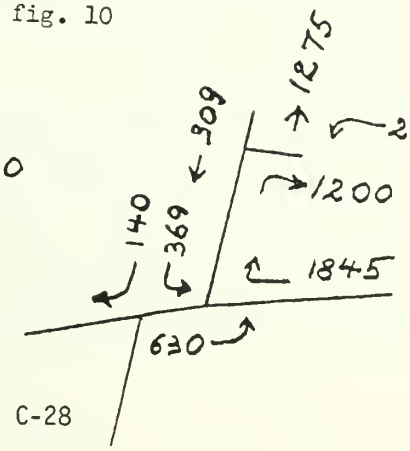
fig. 10

1987 NO BUILD

VI-A-14

fig. 14





VI-F 1987 BUILD

fig. F

The proposed development programs serve as the basic assumptions for the Alewife trip forecasts. The floor space quantities proposed by three studies, the Alewife Boulevard, S&S and S&P, have been taken over by the monograph from th comparative table VI-A of the S&P DEIR. They are causing a problem with the evaluation of the TSMT in the monograph and thus, in the forthcoming FEIR. That problem was explained in the MRWA memorandum of May 15. Secretary Salvucci indicated that the committee should look into it further. The development projections date from the years previous to 1982. It is only natural that they should be updated every few years; e .g., both S&S and W. R. Grace want to see how well their buildings # 1 are leasing before they decide on size and timing of subsequent phases.

As a result of such updated development time table the numbers of the monograph for the right turn into Rindge may differ by less than the 1845 - 750 = 1095 cars, as mentioned on its p. 2. This reduction allows to evaluate the effect of TSMT more fairly. One should not forget, moreover, that S&P have stated all along that the station would function satisfactorily with only the Rindge access. The MRWA is confident that well tested and selected TSMT will suffice without temporary ramps. This is the essence of the MRWA memorandum of May 31. It is scheduled to be the committee's next agenda item.

III. ALEWIFE BY THE YEAR 2000

The monograph lists two objectives for the TSMT at Alewife, maximizing the use of the station and reducing local traffic volume. These are legitimate objectives. The recent example of the town of Belmont indicates that strictly local interests can lead to TSMT of questionable regional consequences. The management proposal to bar access from Route 2 to Belmont between 7 and 9 A. M. will keep the town streets free of congestion; it will not help the overall wider station area traffic flow. It may shift the congestion merely to streets of the town of Arlington

The city of Cambridge has introduced strict parking regulations and zoning by-laws. The three communities would have to collaborate to achieve compatible management measures in order to benefit the so-called new-town-in-town as a whole. The private developers have made enthusiastic plans, but there are indications that the leasing of the completed floor space procedes slowly. Their intentions to apply voluntary management measures for local traffic and parking are welcome. To make them effective for the Alewife area as a whole, their management techniques must be coordinated. The FEIR of S&S has made this point already (p. VIII-A-9).

The overriding objective of all the ongoing activities at Alewife, including the management measures, should have been, and should be in the immediate future, to strive for an Alewife which by 2000 will be a place where people like to work, live and relax. Their objectives should evolve from broadening of the tax base and urbanization to the regional awareness of a healthy balance among social, environmental and growth concerns. In turn, such evolution will benefit all the sometimes conflicting interests. The MRWA suggests that the monograph enlarge the list of its TSMT objectives for the sake of a successful Alewife 2000. The congestion in Arlington and Belmont may be outside the S&P project area, but that should not keep the monograph to consider TSMT in a regional context.

IV. CONCLUSIONS/RECOMMENDATIONS

The MRWA suggests that the monograph include the following:

* To focus on the specific Alewife options of how to keep the through traffic destin to the metropolitan business district constant at the present level or reduce it.

* The objective of a regionally coordinated Alewife 2000. Such neighborhood stabilit - open space - growth "joint development" approach would prevent potential time-and-moneywise costly confrontations. Already the S&S FEIR expressed the expectation that the State appointed Alewife Transportation Coordinator would be instrumental in initiating a renewed interest in joint planning and cooperation (p. VIII-A-9).

* To update the development-program timetable dating from pre-1982 days (DEIR 4931 table VI-A) to present-day projections. This update will reduce the estimated 1987 traffic impacts.

* To reduce the goal of one thousand (1,000) cars parking in a single hour (from 7 to 8 A.M.) in the garage to a more average number.

* To include in the calculation of the high-occupancy-effect (HVO) cars with triangl destination (sec. V.C). The monograph is estimating at present only the effect of an HVO strategy on a reduction of automobiles headed for the garage. Such inclusion would bolster the effect of that management technique. The developer S&S expressed the willingness to adopt the TSMT in his EIR.

The MRWA recommends to the committee:

* To give the advice to the T to perform after the station opening a fair and comprehensive testing of TSMT - including beforehand a public education campaign regionwide.

******

c. c.:

D. D'Eramo
S. Kaiser
D. Kidston
S. Mygatt

SVERDRUP & PARCEL/SEGAL DISARCINA

Written Response to Memorandum from Mystic River Watershed Association, Member; dated August 22, 1984 on Monograph.

The following are generalized comments:

A. Development Assumptions

The MRWA member's memo incorrectly assumes that the development assumptions used in the Alewife Interim Access DEIR and the Monograph were directly from the S&S Cambridgepark FEIR. The Alewife Interim Access DEIR used the S&S development assumptions as a starting point, but then, in accordance with the directives of the MEPA ENF Certificate letter, updated those assumptions.

The results of that updating were documented in Technical Memorandum Nos. 1 and 3, prepared by Segal/DiSarcina Associates in November 1983, which were distributed to the ATAC for discussion and which were published as appendices in the Alewife Interim access DEIR. In addition, on page 66 of the DEIR, the Analysis Assumptions text explicitly notes how the development program was determined.

Thus, the suggestion made by MRWA member on page 4 "To update the development-program timetable dating from pre-1982 days (DEIR 4931 Table VI-A) to present-day projections. This update will reduce the estimated 1987 traffic impacts", is not applicable as the development program assumptions were updated prior to preparing the traffic forecasts.

B. Traffic Forecast Assumptions

The MEPA ENF Certificate letter directed that the Alewife study use the 1987 Build volumes developed in the S&S Final EIR for Cambridgepark. These volumes differ somewhat from the volumes cited in Figure 10 which were taken from the S&S Draft EIR.

The difference between the non-MBTA TRIPS (309 in Figure F and 273 in Figure 14) are due to additional non-Cambridgepark traffic on Rindge Avenue Extension not accounted for in the S&S FEIR.

The difference between the MBTA TRIPS (1,200 in Figure F and 700 in Figure 14) is due to different assumptions regarding the number of MBTA trips going to the station in the AM peak hour.

The MRWA memorandum concludes that the Alewife DEIR forecasts are then incorrect and that the right turn into Rindge Avenue Extension may be high by as much as "1,095 cars". This conclusion does not have merit as it is based upon incorrect or inappropriate references to the S&S DEIR.

In compliance with the MEPA ENF letter, the traffic projections for the Alewife DEIR were based upon the S&S FEIR forecasts (in Figure VIII-A-1) and were modified by an updated development program prepared for the Alewife DEIR.

This is described in the third paragraph of Section 2, Analysis Assumptions, on page 66 of the Alewife DEIR. This process was discussed at several ATAC meetings early in the study process.

C. Garage Peak Hour Volumes

The MRWA memorandum recommends a "more average number" of garage peak hour volumes. The major purpose of the Red Line Extension is to remove automobiles from the peak period traffic flows.

The Alewife DEIR used a peak hour traffic volume of 1,200 vehicles (1,000 parked and 200 drop-off) because that value more closely approximates the experience at other transit stations. Generally, over 50 percent of MBTA parking garage/lot arrivals occur during a one-hour morning peak hour. As a part of this study effort, a survey was made of morning park-ride arrivals at Wellington Station. Seven hundred and eight (or 66 percent) arrived during the morning peak hour out of a total of 1,071 vehicles over a two hour peak period. Thus, the assumption that 50 percent (1,000 vehicles of a garage capacity of 2,000) is more realistic.

D. HOV Calculations

The MRWA memorandum suggests:

> "To include in the calculation of the high-occupancy-effect (HVO) cars with triangle destination (Sec. V.C.). The Monograph is estimating at present only the effect of an HVO strategy on a reduction of automobiles headed for the garage. Such inclusion would bolster the effect of an HVO strategy on a reduction of automobiles headed for the garage. Such inclusion would bolster the effect of that management technique. The developer S&S expressed the willingness to adopt the TSMT in his EIR.

This MRWA conclusion/recommendation appears to state that the Monograph estimated the effect of HOV strategies on only MBTA garage-ground vehicles. In Section V-C on page 9 of the Monograph is an analysis of both HOV and mode split for both MBTA and Cambridgepark vehicles.

E. Through Traffic Assumptions

The MRWA memorandum makes a number of comments concerning through traffic assumptions.

These comments are difficult to understand. They appear to want to improve garage access, while maintaining congestion levels.

The Alewife DEIR does not deal with the larger issues of access in general with the Alewife area. That issue is rather one of the tasks of the MDPW's current Route 2 EIS effort.

The Alewife DEIR deals primarily with providing sufficient access to the garage. Because traffic issues are often synergistic, the provision of that access could have other effects. One of those effects is that all garage

traffic is not new traffic. Rather some 50 percent of the garage traffic is diverted from existing traffic. That diversion effect is shown in the straight through movement on Alewife Brook Parkway southbound past Rindge Avenue Extension. The 1982 existing volume is 2,525 vehicles. The 1987 projected volume is 1,991 vehicles; a reduction of 574 vehicles--about 50 percent of the 1,000 peak hour garage park-ride vehicles.

The result should be that drivers presently traveling through neighborhood streets in Belmont, Arlington and Cambridge to avoid the congestion would divert to the major roadways in the northwest. The major point made in the Monograph is that the Red Line Extension to Alewife is a very significant Transportation System Management improvement in itself for the Northwest Region. In order for this TSM measure to be effective, unimpeded access to the station/garage must be provided for all vehicles, HOV's, buses, vans, etc.

APPENDIX D

DETAILED TRAFFIC WORK SHEETS

(Under Separate Cover)

APPENDIX E

ROUTE 2 ROTARY ISSUES

APPENDIX E

ROUTE 2 ROTARY ISSUES

The DEIR made capacity calculations of the levels of service of the rotary at Route 2 and Alewife Brook Parkway for the existing base case and several alternatives. The DEIR noted (on page 75) that the calculations yielded ". . . unrealistically high v/c ratios; however, the calculations are relevant in that they show the differences among alternatives".

The EOEA Certificate noted that the ". . Final EIR must substantially revamp the analysis of rotary capacity to show proper calibration and thus become more realistic and useful as a prediction method at Alewife".

UNSIGNALIZED ROTARIES

The DEIR rotary calculations were made using a formula in the Transportation and Traffic Engineering Handbook, published by the Institute of Transportation Engineers. The formula includes a logarithmic term defined as "log" which convention defines as a "base 10" logarithm and which base was used in the DEIR capacity calculations. In subsequent reviews with other transportation professionals, it was discovered that the text was in error and that the proper logarithmic form is "ln" which is the "natural" base of "e or 2.72". A recalculation of all of the rotary alternatives was then made and the v/c ratios became more realistic.

Capacity calculations of unsignalized intersections (like rotaries) are also particularly sensitive to "gap" duration; the number of seconds of time between successive vehicles in a traffic stream. In the DEIR rotary calculations, a gap duration of 2.5 seconds was used. In congested situations where vehicles move slowly, smaller gap durations are present. A gap duration of 2.0 seconds (between successive vehicles continuously for an hour) is certainly approaching the lower limit. While gap durations of 2.0 seconds are achievable, the FEIR rotary calculations were performed using gap durations of both 2.0 and 2.5 seconds to determine the sensitivity of small changes in gap durations.

The revised v/c calculations are shown in Table E-1, Route 2 Rotary Area Calculations. The column labeled DEIR shows the rotary v/c calculations from the DEIR which are in error and should be discarded; but are shown only for information.

In the FEIR columns for all alternates which retain the rotary, the calculations indicate v/c ratios in excess of 1.0 except for the 1982 existing PM peak hour. The latter two columns in the table show the total traffic entering and exiting the rotary area for the various alternates. The FEIR v/c ratio calculations increase generally as the traffic volumes increase, indicating a consistency in the calculation methodology.

Of particular interest is the fact that the AM v/c ratios are always significantly higher than the PM v/c ratios for a particular alternate, even though the sum of AM and PM traffic volumes differ only marginally. This is due to the calculation methodology.

During the AM peak hour, the predominant flow is the right-turn from Route 2 to Alewife Brook Parkway southbound, while during the PM peak hour, the predominant flow is the left turn from Alewife Brook Parkway northbound to Route 2 westbound. These are the expected, complimentary movements.

The AM right-turn flow is an outside flow, not theoretically involved in the weaving traffic itself. The PM left-turn flow goes through the rotary and is the predominant flow in the middle of the rotary. Intuition indicates then, that the AM v/c ratios should be lower than the PM v/c ratios since the predominant AM flow is outside of the weaving traffic area while the predominant PM flow is inside the weaving traffic area.

The calculations, in fact, yield just the opposite; better PM v/c ratios and worse AM v/c ratios. This is perhaps explained by the calculation methodology which assigns large "benefits" to a very large weaving movement which "forces" its way through the rotary almost irrespective of other flows. This is the Alewife PM situation. In cases where all weaving movements are more equally balanced, each approach "pays" some significant cost in delay such that the average v/c ratio of all approaches increases significantly. This is the Alewife AM situation.

The general conclusion of the unsignalized rotary analysis is that the projected 1987 Build traffic volumes cause excessive increases in v/c ratios even for the shortest possible gap time of 2.0 seconds. For the No Build alternates, the v/c ratios increase to a range of from 1.11 to 1.53. For the Build Alternates 1 and 2, the v/c ratios increase to a range of from 1.03 to 1.29. Neither of these unsignalized rotary options is acceptable because the v/c ratios are too high and because Alternates 1 and 2 require a traffic signal on Route 2 near Acorn Park roadway which is unacceptable.

SIGNALIZED INTERSECTIONS

Build Alternates 3a and 4 reconfigure the rotary into a three-phase signalized intersection with a fourth leg coming from the Alewife Station into the intersection. The EOEA Certificate raised issues about lane mergings with the DEIR design sketch. Investigations of the traffic volume projections when the Alewife Brook Parkway left turn to Route 2 outbound and the interim access roadway straight movement to Route 2 outbound are operating together on the same phase indicates that two moving lanes are required for the Alewife Brook Parkway movement and one moving lane is required for the interim access movement.

The rotary has been redesigned to provide a two lane plus one lane into a three lane farside exit which then tapers into two lanes on Route 2 outbound by the railroad bridge. This design modification has also allowed for more storage for waiting vehicles.

SIGNALIZED ROTARIES

The issue has also been raised as to whether signalizing the rotary itself would provide a satisfactory solution. Merely signalizing the existing rotary is totally unsatisfactory because of poor storage and sight distances.

The area could be reconfigured into a better designed rotary. If it is assumed that the inbound access roadway is built and that the outbound interim access roadway of either Alternate 3a or 4 is constructed, then the rotary would have to be operated as a four-phase traffic signal. With this four-legged, four-phased, signalized rotary, the v/c ratios would be 1.27 in the morning and 1.39 in the evening.

Both of these signalized rotary options have v/c ratios which are excessive and which compared to the signalized intersection are deemed unacceptable. In addition, the construction costs of a new signalized rotary would be similar to the costs of a new signalized intersection because of the extensive grading and channelization that would be required.

TABLE E-1

Route 2 Rotary Area Calculations

Alternatives	Peak Hour	V/C Ratios: DEIR with t=2.5	V/C Ratios: FEIR with t=2.5	V/C Ratios: FEIR with t=2.0	V/C Ratios: % Change 1987 to 1982 v/c	Traffic Data: Sum of Traffic Volumes	Traffic Data: % Change 1987 to 1982 Vol.
1982 Existing	AM	2.96	1.30	1.04	--	12,050	--
	PM	2.57	1.12	0.89	--	12,280	--
1987 No Build Unconstrained	AM	4.38	1.91	1.53	+47%	15,666	+30%
	PM	3.31	1.44	1.15	+29%	15,756	+28%
1987 No Build Constrained	AM	4.20	1.61	1.29	+24%	14,866	+23%
	PM	3.20	1.39	1.11	+25%	14,976	+22%
1987 Build Alternates 1 & 2	AM	3.53	1.54	1.23	+19%	13,220	+9%
	PM	2.95	1.29	1.03	+20%	13,204	+7%
1987 Build Alternate 4 with Signalized Rotary	AM	NA	NA	1.07	+3%	14,443	+20%
	PM	NA	NA	1.49	+67%	15,547	+27%
1987 Build Alternate 3a	AM	0.96	NA	0.96	-11%	15,666	+30%
	PM	0.99	NA	1.03	+18%	15,756	+28%
1987 Build Alternate 4	AM	0.96	NA	0.96	-11%	14,443	+20%
	PM	0.99	NA	1.03	+18%	15,547	+27%

Notes:
- "t" equals time in seconds of gap durations
- "Sum of Traffic Volumes" equals the sum of all entering and exiting traffic volumes in the intersection during the peak hour
- "t" or gap duration is not applicable in Alternates 3a and 4
- Traffic Data is for condition where triangle traffic is routed on an interim access roadway where applicable.

APPENDIX F

CALCULATION OF MOTOR VEHICLE EMISSION RATES FOR CARBON MONOXIDE

APPENDIX F

CALCULATION OF MOTOR VEHICLE
EMISSION RATES FOR CARBON MONOXIDE

Worksheet 5 - Intersection CO Dispersion Analysis, as included in Appendix E of the DEIS, contained some minor errors. A corrected Worksheet 5 is attached.

The text of Appendix E of the DEIS referred to six tables, but only five tables were included. Table 6 reads as follows:

TABLE 6

IDLE MODE CORRECTION FACTORS*
BY CALENDAR YEAR

Time Period	1984	1987
Peak 1-Hour	1.55	0.93
Peak 8-Hour	1.05	0.64

* Correction factor is a composite emission factor at 5 mph (from MOBILE2) divided by 182.5 g/mile, the emission factor at 5 mph for the standard conditions used in the Guideline document, namely year = 1977, temperature = 75 degrees F, vehicle mix = 100 percent LDGV, cold start = 0 percent, hot start = 0 percent.

WORKSHEET 5 - INTERSECTION CO DISPERSION ANALYSIS

Intersection ROUTE 2 / INTERIM ACCESS ROAD

Case # 1 Year 1984 Averaging Time 1 Hour

Line No.	Symbol	Input/Units	Traffic Stream 2W	2E		
1	SC	Stability Class	D			
2	U	Wind Speed ($m\ s^{-1}$)	1.0			
3	θ	Wind-Road Angle (deg)	4	4		
4	x	Lateral Distance (m)	10	23		
5	Yu	Maximum Longitudinal Distance (m)	NA	NA		
6	Yd	Minimum Longitudinal Distance (m)	NA	NA		
7	σ_{zo}	Initial Dispersion (m)	5			
8	Qe	Excess Emissions Rate ($gm^{-1}s^{-1}$)	0	0		
9	Qf	Free Flow Emissions Rate ($gm^{-1}s^{-1}$)	.0216	.0158		
9a		Street Canyon? Yes or No				
		DISPERSION ANALYSIS				
10	χUQ^{-1}	Normalized Concentration ($10^{-3}m^{-1}$) Free Flow	800	530		
	Qf	Enter Line 9	x	x	x	x
11	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2	÷	÷	÷	÷
12	χ	CO Concentration ($mg\ m^{-3}$) Through Emissions	17.28	8.37		
13	χUQ^{-1}	Normalized Concentration (For Yu)	0	0		
	Qe	Enter Line 8				
14	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
15	χ	CO Concentration-"Maximum Queue"	0	0		
16	χUQ^{-1}	Normalized Concentration (For Yd)	0	0		
	Qe	Enter Line 8	x	x	x	x
17	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
18	χ	CO Concentration-"Imaginery Queue"	÷ 0	÷ 0	÷	÷
19	χ	CO ($mg\ m^{-3}$) Total	17.28	8.37		
20	χ	CO Concentration (ppm)-- Total	15.0	7.3		
		OPTIONAL z-CORRECTION (Heights Other than 1.8m Above the Ground)				
21	z	Height of Receptor (m)				
22		z-Correction Factor				
23	χ'	CO Concentration at Height z ($mg\ m^{-3}$)				
24	χ'	CO Concentration at Height z (ppm)				

22.3 ppm

WORKSHEET 5 - INTERSECTION CO DISPERSION ANALYSIS

Intersection ROUTE 2 / INTERIM ACCESS ROAD

Case # 1 Year 1984 Averaging Time 8 Hour

Line No.	Symbol	Input/Units	Traffic Stream 2W	2E		
1	SC	Stability Class	D			
2	U	Wind Speed ($m\ s^{-1}$)	3.0			
3	θ	Wind-Road Angle (deg)	4	4		
4	x	Lateral Distance (m)	10	23		
5	Yu	Maximum Longitudinal Distance (m)	NA	NA		
6	Yd	Minimum Longitudinal Distance (m)	NA	NA		
7	σ_{zo}	Initial Dispersion (m)	5			
8	Qe	Excess Emissions Rate ($gm^{-1}s^{-1}$)	0	0		
9	Qf	Free Flow Emissions Rate ($gm^{-1}s^{-1}$)	.0110	.0081		
9a		Street Canyon? Yes or No				
		DISPERSION ANALYSIS				
10	χUQ^{-1}	Normalized Concentration ($10^{-3}m^{-1}$) Free Flow	800	530		
	Qf	Enter Line 9	x	x	x	x
11	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2	÷	÷	÷	÷
12	χ	CO Concentration ($mg\ m^{-3}$) Through Emissions	2.93	1.43		
13	χUQ^{-1}	Normalized Concentration (For Yu)	0	0		
	Qe	Enter Line 8				
14	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
15	χ	CO Concentration-"Maximum Queue"	0	0		
16	χUQ^{-1}	Normalized Concentration (For Yd)	0	0		
	Qe	Enter Line 8	x	x	x	x
17	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
18	χ	CO Concentration-"Imaginery Queue"	÷ 0	÷ 0	÷	÷
19	χ	CO ($mg\ m^{-3}$) Total	2.93	1.43		
20	χ	CO Concentration (ppm)-- Total	2.6	1.2		
		OPTIONAL z-CORRECTION (Heights Other than 1.8m Above the Ground)				
21	z	Height of Receptor (m)				
22		z-Correction Factor				
23	χ'	CO Concentration at Height z ($mg\ m^{-3}$)				
24	χ'	CO Concentration at Height z (ppm)				

3.8 ppm

WORKSHEET 5 - INTERSECTION CO DISPERSION ANALYSIS

Intersection ROUTE 2/INTERIM ACCESS ROAD

Case # 2 Year 1987 Averaging Time 1 Hour

Line No.	Symbol	Input/Units	Traffic Stream 2W	2E		
1	SC	Stability Class	D			
2	U	Wind Speed ($m\ s^{-1}$)	1.0			
3	θ	Wind-Road Angle (deg)	4	4		
4	x	Lateral Distance (m)	10	23		
5	Yu	Maximum Longitudinal Distance (m)	NA	NA		
6	Yd	Minimum Longitudinal Distance (m)	NA	NA		
7	σ_{zo}	Initial Dispersion (m)	5			
8	Qe	Excess Emissions Rate ($gm^{-1}s^{-1}$)	0	0		
9	Qf	Free Flow Emissions Rate ($gm^{-1}s^{-1}$)	.0177	.0110		
9a		Street Canyon? Yes or No				
		DISPERSION ANALYSIS				
10	χUQ^{-1}	Normalized Concentration ($10^{-3}m^{-1}$) Free Flow	800	530		
	Qf	Enter Line 9	x	x	x	x
11	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2	÷	÷	÷	÷
12	χ	CO Concentration ($mg\ m^{-3}$) Through Emissions	14.16	5.83		
13	χUQ^{-1}	Normalized Concentration (For Yu)	0	0		
	Qe	Enter Line 8				
14	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
15	χ	CO Concentration-"Maximum Queue"	0	0		
16	χUQ^{-1}	Normalized Concentration (For Yd)	0	0		
	Qe	Enter Line 8	x	x	x	x
17	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
18	χ	CO Concentration-"Imaginery Queue"	÷ 0	÷ 0	÷	÷
19	χ	CO ($mg\ m^{-3}$) Total	14.16	5.83		
20	χ	CO Concentration (ppm)-- Total	12.3	5.1		
		OPTIONAL z-CORRECTION (Heights Other than 1.8m Above the Ground)				
21	z	Height of Receptor (m)				
22		z-Correction Factor				
23	χ'	CO Concentration at Height z ($mg\ m^{-3}$)				
24	χ'	CO Concentration at Height z (ppm)				

17.4 ppm

WORKSHEET 5 - INTERSECTION CO DISPERSION ANALYSIS

Intersection Route 2 / Interim Access Road

Case # 2 Year 1987 Averaging Time 8 Hour

Line No.	Symbol	Input/Units	Traffic Stream 2W	2E		
1	SC	Stability Class	D			
2	U	Wind Speed ($m\ s^{-1}$)	3.0			
3	θ	Wind-Road Angle (deg)	4	4		
4	x	Lateral Distance (m)	10	23		
5	Yu	Maximum Longitudinal Distance (m)	NA	NA		
6	Yd	Minimum Longitudinal Distance (m)	NA	NA		
7	σ_{zo}	Initial Dispersion (m)	5			
8	Qe	Excess Emissions Rate ($gm^{-1}s^{-1}$)	0	0		
9	Qf	Free Flow Emissions Rate ($gm^{-1}s^{-1}$)	.0092	.0057		
9a		Street Canyon? Yes or No				
		DISPERSION ANALYSIS				
10	χUQ^{-1}	Normalized Concentration ($10^{-3}m^{-1}$) Free Flow	800	580		
	Qf	Enter Line 9	x	x	x	x
11	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2	÷	÷	÷	÷
12	χ	CO Concentration ($mg\ m^{-3}$) Through Emissions	2.45	1.01		
13	χUQ^{-1}	Normalized Concentration (For Yu)	0	0		
	Qe	Enter Line 8				
14	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
15	χ	CO Concentration-"Maximum Queue"	0	0		
16	χUQ^{-1}	Normalized Concentration (For Yd)	0	0		
	Qe	Enter Line 8	x	x	x	x
17	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
18	χ	CO Concentration-"Imaginery Queue"	÷ 0	÷ 0	÷	÷
19	χ	CO ($mg\ m^{-3}$) Total	2.45	1.01		
20	χ	CO Concentration (ppm)-- Total	2.1	0.9		
		OPTIONAL z-CORRECTION (Heights Other than 1.8m Above the Ground)				
21	z	Height of Receptor (m)				
22		z-Correction Factor				
23	χ'	CO Concentration at Height z ($mg\ m^{-3}$)				
24	χ'	CO Concentration at Height z (ppm)				

3.0 ppm

WORKSHEET 5 - INTERSECTION CO DISPERSION ANALYSIS

Intersection ROUTE 2 / INTERIM ACCESS ROAD

Case # 3 Year 1987 Averaging Time 1 HOUR

Line No.	Symbol	Input/Units	Traffic Stream: 2W	2E	IAR	
1	SC	Stability Class	D			
2	U	Wind Speed (m s^{-1})	1.0			
3	θ	Wind-Road Angle (deg)	78	78	12	
4	x	Lateral Distance (m)	10	23	15	
5	Yu	Maximum Longitudinal Distance (m)	NA	324	167	
6	Yd	Minimum Longitudinal Distance (m)	NA	38	50	
7	σ_{zo}	Initial Dispersion (m)	5			
8	Qe	Excess Emissions Rate ($gm^{-1}s^{-1}$)	0	.0360	.0653	
9	Qf	Free Flow Emissions Rate ($gm^{-1}s^{-1}$)	.0177	.0110	.0122	
9a		Street Canyon? Yes or No				
		DISPERSION ANALYSIS				
10	χUQ^{-1}	Normalized Concentration ($10^{-3}m^{-1}$) Free Flow	150	140	490	
	Qf	Enter Line 9	x	x	x	x
11	χU	Normalized Concentration (mg $m^{-2}s^{-1}$)				
	U	Enter Line 2	÷	÷	÷	÷
12	χ	CO Concentration (mg m^{-3}) Through Emissions	2.66	1.54	5.98	
13	χUQ^{-1}	Normalized Concentration (For Yu)	0	140	380	
	Qe	Enter Line 8				
14	χU	Normalized Concentration (mg $m^{-2}s^{-1}$)				
	U	Enter Line 2				
15	χ	CO Concentration-"Maximum Queue"	0	5.04	24.81	
16	χUQ^{-1}	Normalized Concentration (For Yd)	0	140	40	
	Qe	Enter Line 8	x	x	x	x
17	χU	Normalized Concentration (mg $m^{-2}s^{-1}$)				
	U	Enter Line 2				
18	χ	CO Concentration-"Imaginery Queue"	0	5.04	2.61	
19	χ	CO (mg m^{-3}) Total	2.66	1.54	28.18	
20	χ	CO Concentration (ppm)-- Total	2.3	1.3	24.5	
		OPTIONAL z-CORRECTION (Heights Other than 1.8m Above the Ground)				
21	z	Height of Receptor (m)				
22		z-Correction Factor				
23	χ'	CO Concentration at Height z (mg m^{-3})				
24	χ'	CO Concentration at Height z (ppm)				

28.1 ppm

WORKSHEET 5 - INTERSECTION CO DISPERSION ANALYSIS

Intersection ROUTE 2/ INTERIM ACCESS ROAD

Case # 3 Year 1987 Averaging Time 8 Hour

Line No.	Symbol	Input/Units	Traffic Stream 2W	2E	IAR	
1	SC	Stability Class	D			
2	U	Wind Speed ($m\ s^{-1}$)	3.0			
3	θ	Wind-Road Angle (deg)	4	4	86	
4	x	Lateral Distance (m)	10	23	15	
5	Yu	Maximum Longitudinal Distance (m)	NA	324	122	
6	Yd	Minimum Longitudinal Distance (m)	NA	38	50	
7	σ_{zo}	Initial Dispersion (m)	5			
8	Qe	Excess Emissions Rate ($gm^{-1}s^{-1}$)	0	.0087	.0116	
9	Qf	Free Flow Emissions Rate ($gm^{-1}s^{-1}$)	.0092	.0057	.0031	
9a		Street Canyon? Yes or No				
		DISPERSION ANALYSIS				
10	χUQ^{-1}	Normalized Concentration ($10^{-3}m^{-1}$) Free Flow	800	530	140	
	Qf	Enter Line 9	x	x	x	x
11	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2	÷	÷	÷	÷
12	χ	CO Concentration ($mg\ m^{-3}$) Through Emissions	2.45	1.01	0.14	
13	χUQ^{-1}	Normalized Concentration (For Yu)	0	370	140	
	Qe	Enter Line 8				
14	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
15	χ	CO Concentration-"Maximum Queue"	0	1.07	0.54	
16	χUQ^{-1}	Normalized Concentration (For Yd)	0	0	140	
	Qe	Enter Line 8	x	x	x	x
17	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
18	χ	CO Concentration-"Imaginery Queue"	÷ 0	÷ 0	÷ 0.54	÷
19	χ	CO ($mg\ m^{-3}$) Total	2.45	2.08	0.14	
20	χ	CO Concentration (ppm)-- Total	2.1	1.8	0.1	
		OPTIONAL z-CORRECTION (Heights Other than 1.8m Above the Ground)				
21	z	Height of Receptor (m)				
22		z-Correction Factor				
23	χ'	CO Concentration at Height z ($mg\ m^{-3}$)				
24	χ'	CO Concentration at Height z (ppm)				

4.0 ppm

WORKSHEET 5 - INTERSECTION CO DISPERSION ANALYSIS

Intersection ROUTE 2/ INTERIM ACCESS ROAD

Case # 4 Year 1987 Averaging Time 1 HOUR

Line No.	Symbol	Input/Units	Traffic Stream 2W	2E		
1	SC	Stability Class	D			
2	U	Wind Speed ($m\ s^{-1}$)	1.0			
3	θ	Wind-Road Angle (deg)	4	4		
4	x	Lateral Distance (m)	10	23		
5	Yu	Maximum Longitudinal Distance (m)	NA	NA		
6	Yd	Minimum Longitudinal Distance (m)	NA	NA		
7	σ_{zo}	Initial Dispersion (m)	5			
8	Qe	Excess Emissions Rate ($gm^{-1}s^{-1}$)	0	0		
9	Qf	Free Flow Emissions Rate ($gm^{-1}s^{-1}$)	.0177	.0110		
9a		Street Canyon? Yes or No				
		DISPERSION ANALYSIS				
10	XUQ^{-1}	Normalized Concentration ($10^{-3}m^{-1}$) Free Flow	800	530		
	Qf	Enter Line 9	x	x	x	x
11	XU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2	÷	÷	÷	÷
12	X	CO Concentration ($mg\ m^{-3}$) Through Emissions	14.16	5.83		
13	XUQ^{-1}	Normalized Concentration (For Yu)	0	0		
	Qe	Enter Line 8				
14	XU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
15	X	CO Concentration-"Maximum Queue"	0	0		
16	XUQ^{-1}	Normalized Concentration (For Yd)	0	0		
	Qe	Enter Line 8	x	x	x	x
17	XU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
18	X	CO Concentration-"Imaginery Queue"	÷ 0	÷ 0	÷	÷
19	X	CO ($mg\ m^{-3}$) Total	14.16	5.83		
20	X	CO Concentration (ppm)-- Total	12.3	5.1		
		OPTIONAL z-CORRECTION (Heights Other than 1.8m Above the Ground)				
21	z	Height of Receptor (m)				
22		z-Correction Factor				
23	X'	CO Concentration at Height z ($mg\ m^{-3}$)				
24	X'	CO Concentration at Height z (ppm)				

17.4 ppm

WORKSHEET 5 - INTERSECTION CO DISPERSION ANALYSIS

Intersection ROUTE 2 / INTERIM ACCESS ROAD

Case # 4 Year 1987 Averaging Time 8 Hour

Line No.	Symbol	Input/Units	Traffic Stream 2W	2E		
1	SC	Stability Class	D			
2	U	Wind Speed ($m\ s^{-1}$)	3.0			
3	θ	Wind-Road Angle (deg)	4	4		
4	x	Lateral Distance (m)	10	23		
5	Yu	Maximum Longitudinal Distance (m)	NA	NA		
6	Yd	Minimum Longitudinal Distance (m)	NA	NA		
7	σ_{zo}	Initial Dispersion (m)	5			
8	Qe	Excess Emissions Rate ($gm^{-1}s^{-1}$)	0	0		
9	Qf	Free Flow Emissions Rate ($gm^{-1}s^{-1}$)	.0092	.0057		
9a		Street Canyon? Yes or No				
		DISPERSION ANALYSIS				
10	χUQ^{-1}	Normalized Concentration ($10^{-3}m^{-1}$) Free Flow	800	530		
	Qf	Enter Line 9	x	x	x	x
11	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2	÷	÷	÷	÷
12	χ	CO Concentration ($mg\ m^{-3}$) Through Emissions	2.45	1.01		
13	χUQ^{-1}	Normalized Concentration (For Yu)	0	0		
	Qe	Enter Line 8				
14	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
15	χ	CO Concentration-"Maximum Queue"	0	0		
16	χUQ^{-1}	Normalized Concentration (For Yd)	0	0		
	Qe	Enter Line 8	x	x	x	x
17	χU	Normalized Concentration ($mg\ m^{-2}s^{-1}$)				
	U	Enter Line 2				
18	χ	CO Concentration-"Imaginery Queue"	÷ 0	÷ 0	÷	÷
19	χ	CO ($mg\ m^{-3}$) Total	2.45	1.01		
20	χ	CO Concentration (ppm)-- Total	2.1	0.9		
		OPTIONAL z-CORRECTION (Heights Other than 1.8m Above the Ground)				
21	z	Height of Receptor (m)				
22		z-Correction Factor				
23	χ'	CO Concentration at Height z ($mg\ m^{-3}$)				
24	χ'	CO Concentration at Height z (ppm)				

3.0 ppm

APPENDIX G

MONOGRAPH ON THE APPLICATION OF TRANSPORTATION SYSTEMS MANAGEMENT MEASURES AS AN ELEMENT OF THE MBTA ALEWIFE STATION INTERIM ACCESS

MONOGRAPH ON THE APPLICATION OF TRANSPORTATION SYSTEMS MANAGEMENT MEASURES AS AN ELEMENT OF THE MBTA ALEWIFE STATION INTERIM ACCESS PROJECT

PREPARED IN RESPONSE
TO A REQUEST OF THE
SECRETARY OF THE ENVIRONMENTAL AFFAIRS
IN THE CERTIFICATE ON THE DEIR
EOEA NO. 4931

PREPARED FOR THE

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

BY

SVERDRUP & PARCEL AND ASSOCIATES, INC.
IN ASSOCIATION WITH
SEGAL DISARCINA ASSOCIATES

AUGUST 1984

G-3

MONOGRAPH ON THE APPLICATION OF TRANSPORTATION SYSTEMS MANAGEMENT MEASURES AS AN ELEMENT OF THE MBTA ALEWIFE STATION INTERIM ACCESS PROJECT

I BACKGROUND

This paper has been prepared in response to a request from the Executive Office of Environmental Affairs (p. 6 of the Certificate of the Secretary on the DEIR) that the EOTC and MBTA prepare a monograph outlining transportation systems management (TSM) techniques they would propose to use to help reduce vehicle trip generation in the Alewife area during peak hours.

The concept of transportation systems management evolved out of the need to make better continuing use of existing transportation resources and facilities. This emphasis on TSM came about both because of the scarcity of capital available to create replacement resources and facilities and because guidelines were required to help establish priorities among capital projects. The replacement of existing facilities could be deferred if they could be made to perform their intended function more adequately through the application of management techniques. In addition, the application of these techniques can make new facilities function more effectively.

The use and effectiveness of TSM techniques have been debated by the Alewife Transportation Advisory Committee (ATAC) in terms of their application to the Alewife Station Interim Access project. In view of the projected traffic to be generated by the Alewife Station and by land development activities, it is clear that ways must be found to reduce peak hour traffic, particularly at the critical Alewife Brook Parkway-Rindge Avenue Extension intersection. The application of such TSM techniques as requiring higher vehicle occupancy and encouraging a higher modal split between transit and autos would have an effect. Would their application as well as the use of other TSM measures be sufficient to reduce traffic to manageable proportions without the construction of Interim Access ramps to the Station?

It is intended that this monograph be included in the Alewife Station Interim Access Final Environmental Impact Report as an appendix. It is also intended that the description of the specific measures proposed herein be incorporated in the body of the FEIR text as an element of the Preferred Alternative.

II OBJECTIVES

The objectives of any Transportation Systems Management techniques at the Alewife Station would be:

- To assist the MBTA to realize its objective of maximizing the use of the station and transit ridership by diverting people from autos to transit; by facilitating access to the station by pedestrians, bicyclists, and bus passengers as well as auto riders; and by minimizing conflicts between station traffic and other traffic moving into or through the Alewife area.

- To offer measures that can be taken, without significant detriment to their business activities, by property owners, building managers, employers and employees to reduce the number of automobiles entering the Alewife area.

III PROBLEM DEFINITION

The severity of traffic congestion is measured by traffic volume to roadway capacity ratios (v/c ratios). The v/c ratio is a calculation made to measure the level of congestion on a highway or at an intersection. The volume of vehicles, or "v", is the actual or projected traffic that uses the facility. The capacity, or "c", is the maximum number of vehicles that could use the roadway. The v/c ratio, then, is a measure of how full a facility is compared to its theoretical capacity. As the v/c ratio approaches a value of 1.0, the congestion levels increase.

The problem then, essentially, is that v/c ratios are exceeding 1.0 at critical points and at critical times. What TSM measures are available and how effective can they be in reducing local and through traffic volumes and v/c ratios?

The major constraint to accessing the Alewife Station is the intersection of Alewife Brook Parkway and Rindge Avenue Extension. This constraint occurs in the morning peak hour and again in the evening peak hour, which is essentially a mirror-image of the AM peak hour problem.

The major impediment to a reduction of v/c levels at the Rindge Avenue intersection during the morning peak hour is the right-turn volume. If the right-turn volume can be reduced from a No Build Alternative level of 1,845 vehicles to a volume of about 750 vehicles, then the station operates well. With such a reduction in right turns, the through traffic movements are the major constraints to smooth traffic flow.

IV POSSIBLE TSM MEASURES

The TSM measures discussed by the Advisory Committee during the preparation of the DEIR have been reorganized into two categories. The first

category includes those actions that could be taken by the MBTA. The second category incorporates actions by the employers, building owners and managers, and employees in the Alewife area.

The transportation systems management techniques that could be taken by the MBTA relate to:

- Garage opening strategies
- Controlling use of garage by vehicle type
- Controlling use of garage by time of day
- Maximizing use of feeder buses
- Authorizing use of Alewife bus terminal by private carriers and community bus systems
- Developing a system of satellite parking areas
- Maintaining dependable subway service

The traffic control techniques that, to be effective, require the sustained and widespread cooperation of Alewife area employers and building owners and managers as well as employees include:

- Use of carpools, vanpools, shuttle buses, shared taxis and subscription buses
- Encouraging tenants with low demands for parking
- Controlling parking spaces by vehicle type
- Controlling parking by time of day
- Use of flexible work schedules

A. MBTA Actions

A basic purpose of the extension of the Red Line to Alewife is to reduce automobile commuting to and congestion in the downtown core. Most of the automobile commuting occurs during the peak hours. Therefore a fundamental objective in the use of the Alewife Garage is to get as many cars as possible off the streets and into the garage during the AM peak period. To encourage garage use, both AM access into it and PM egress from it should be as free flowing as possible.

A second major objective of the MBTA is to maximize transit ridership. More riders are obtained from high-occupancy vehicles (HOVs) than low-occupancy vehicles (LOVs). If the garage proves so successful that it is filled early in the AM peak period then, if they can be proven to be cost-effective, steps could be taken to:

- Give priority to high-occupancy vehicles
- Encourage occupants of low-occupancy vehicles to join others in high-occupancy vehicles

A third objective of the MBTA is to derive as high a proportion of its income from revenues as possible, consistent with its broader needs to conform to public policies. Pricing strategies for the garage therefore become an important element. High prices would reduce demand; low prices would increase demand. The relationship between garage revenues, transit ridership

revenues, number of cars (and occupants) diverted from the highways and transit ridership need to be constantly assessed.

Garage Opening Strategy - Experience with other new garages has shown that it will probably take some months for the garage traffic to build up to capacity. During that time the MBTA would monitor the garage activity to build up base information about auto-occupancy rates, percent of spaces occupied by incremental 15 minute periods, and the like. One or more surveys of all boarding transit riders and/or occupants of vehicles entering the garage would be useful in developing this data base concerning activity under uncontrolled circumstances.

Controlling Use of Garage by Time of Day - This technique has been discussed by the ATAC and by others as a means to reduce peak hour congestion. It is reasoned that if, say, only 1,000 spaces were permitted to be used during the AM peak period, the number of right turns from Alewife Brook Parkway into Rindge Avenue Extension could be cut in half during the AM peak, because the second 1,000 drivers would soon learn that garage space is not available to them. However, the result would be that this second 1,000 would remain part of the through traffic passing through the Rindge Avenue intersection or using by-pass streets through Belmont. Alternatively, if they are determined to take some advantage of the accessibility of the Alewife station, they would drop-off passengers there and continue on their journey to work. They would then be making turning movements at the Rindge Avenue Extension-Alewife Brook Parkway twice during the AM peak.

Use of this technique would thus be counter productive and inconsistent with the MBTA's objectives of removing AM peak hour traffic from the streets and maximizing transit ridership. The MBTA should encourage the full use of the 2,000 spaces in the garage as early as possible after opening, and should encourage AM peak hour drivers to use it.

Then, as the garage approaches capacity, other selected TSM techniques could be imposed.

HOV Garage Priority - As the garage reaches capacity, a proportion of the spaces could be reserved for use by HOVs exclusively, or LOVs could be charged a higher per vehicle fee. Each technique could be tried, but not in combination, to ascertain their effectiveness. The ratio of spaces allocated or the differential in fees would be largely a matter of trial and error, but it should be kept in mind that the objectives of the tests are to increase ridership, to keep the garage fully occupied, and to increase revenues to at least cover policing and other costs associated with administering such a program.

Encouraging LOV Occupants to Join HOV Pools - This is not an objective easily achieved because of the wide variations in individuals' time demands, schedule irregularities, travel patterns and life styles. This technique would make greater use of existing Caravan, Inc. resources. It would expand current EOTC and MBTA efforts to:

- Work through large Boston and Cambridge employers to reach employees either driving to work or using MBTA garages and

explore ways in which they might be induced to begin their HOV journey closer to home. Of course, the most feasible HOV mode in some instances might be one which would use the bus terminal rather than the garage.

- o Work through local community groups to organize carpools or vanpools through neighborhood associations, churches, or local transportation committees.

Again, this program involves continuing additional adminstrative costs which must be taken into account when evaluating program effectiveness.

Bus Service - As indicated above, exploration of techniques for increasing the ratio of HOVs may reveal that bus service may be found more attractive for some than carpools or vanpools if the bus service could be tailored to meet their needs.

The Lexington Transportation Advisory Committee has already approached the MBTA about the possibility of running a Lexpress route to Alewife.

The current Northwest Corridor MBTA bus study recognizes that the bus network needs to be designed to meet the needs of all potential riders, not just those destined for the Red Line. For example, many northwest corridor residents whose destination is the Harvard Square area may prefer, for both cost and convenience reasons, to take a single vehicle bus ride from their home neighborhood direct to Harvard Square without the extra transfer and extra fare at Alewife. With many present bus system riders continuing to use a direct to Harvard Square route, new, less crowded service to Alewife should attract additional riders over those now using buses.

Subway Service - Equipment or track failures, signal and communications breakdowns, and delays caused by other circumstances have produced a deterioration in service, and perhaps more importantly, in peoples perception of the Red Line as a dependable line. Several current actions of the MBTA are designed to assure increased total system dependability. These include, among other things, the rebuild of the existing fleet, the ordering of 54 new cars, the lengthening of all platforms to permit six-car operation, and upgrading the power distribution system.

The progress of these programs should be monitored to assess the effectiveness of these measures. Early warning alarms should be sounded as necessary to encourage adjustments aimed at increasing effectiveness or to prompt the introduction of additional remedial measures.

Satellite Parking - In the Boston metropolitan area, with its one vehicle ride to downtown by commuter rail, express bus or rapid transit being available in so many corridors, the concept of satellite parking requiring a bus shuttle faces competition as an acceptable travel mode. Nevertheless, the MBTA has an active parking program which includes the creation of satellite facilities. Two locations currently being examined are the St. Camillus church parking lot on Route 2 and the former Arlington Heights bus yard on Massachusetts Avenue.

Locations which would be served by express bus to Boston or Cambridge and by shuttle buses or vanpools to suburban industrial complexes as well as a shuttle to Alewife, would probably prove most popular.

B. Alewife Employers Actions

To this point, the TSM discussion has been limited to: a) taking peak-hour through traffic off the highway and putting it into the Alewife garage, b) when competition for garage space intensifies, giving priority to higher-occupancy vehicles, and c) having people start their mass transit journey further out and either transfer from one mass transit mode to another at Alewife, or by-pass Alewife entirely.

The Alewife station and garage are at the apex of an area of intense development activity. By 1987, assuming the full development projections, the Alewife station and garage will be generating only 25 percent of the total peak-hour street traffic generated by activities in the Alewife area.

To permit the whole Alewife area to function, a transportation systems management program must also seek ways of limiting and managing development traffic in a manner consistent with the local and regional objectives of encouraging jobs and tax-paying land uses.

Transit Ridership - Employees should be encouraged to use transit to and from work. Job opportunities should be advertised in the newspapers of communities served by transit lines routed to Alewife. Passholders could receive bonuses or benefits of some nature from their employers, such as employers participating in the costs of employee passes. The MBTA is constantly working with employers to encourage transit and pass use.

Carpools and Vanpools - Alewife area employees should be encouraged to avail themselves of services provided by Caravan, Inc.

Shuttle Bus, Shared Taxi, Subscription Bus - With the Alewife Terminal in place, the applicability of these modes would be less than for areas not as well served by transit. Nevertheless, employers should be encouraged to identify situations in which they may prove to be applicable, such as the A. D. Little shuttle to Belmont Center.

Parking Controls - Each business in the area could probably benefit from some procedures for controlling parking in the areas assigned to them. Certainly carpools and vanpools should be assured of spaces, as should flex-time workers who arrive after the morning peak. Businesses have had long experience in developing and maintaining parking controls, and Alewife businesses should be encouraged to use the most effective applicable techniques.

Flexible Work Schedules - Coordinating efforts among the various businesses in the area to develop flexible work schedules appropriate to their own needs should be encouraged. The MBTA has information on and promotes the use of flexible work schedules.

Reduced Parking Demand - Community policy, through zoning, already assumes the area will be occupied by businesses with lower than average parking demand. Whether this level of demand can be reduced further by offering rental, tax or other incentives, needs further analysis by building owner and manager and community representatives.

V THE EFFECTIVENESS OF TSM MEASURES

The foregoing section described several TSM techniques that are being or could be applied in the Alewife area. Experience elsewhere indicates that some of these measures have proven more effective than others.

The more general effects of TSM strategies were investigated for the U. S. Department of Transportation by A. M. Voorhees, Inc. and described in a report entitled, TSM, An Assessment of Impacts, dated November 1978. An abstract of the summary of work trip changes found by that study to be due to the implementation of classes of TSM strategies is shown in Table 1 at the end of this report.

If the TSM actions described earlier for application at Alewife were grouped in the classes investigated by Voorhees, the following groups would result.

Class A - Actions Which Reduce Travel Demand

Maximizing use of feeder buses.
Authorizing use of Alewife bus terminal by private carriers and community bus systems.
Developing a system of satellite parking areas.
Maintaining dependable subway service.
Use of carpools, vanpools, shuttle buses, shared taxis and subscription buses.

Class B - Actions Which Enhance Highway Supply

Use of flexible work schedules.

Class C - Actions Which Reduce Demand and Degrade Supply

Controlling use of garage by vehicle type.
Controlling use of garage by time of day.
Encouraging tenants with low demand for parking.
Controlling parking spaces by vehicle type.
Controlling parking by time of day.

Class D - Actions Which Reduce Demand and Enhance Supply

Class D, like Class C, also is related to giving preference to HOVs, but without reducing the number of lanes available to general traffic. The HOV preferential treatment proposed for the Alewife area would be a Class D action concerning the use of the highways and a Class C action concerning the use of parking areas.

Essentially, the Voorhees study finds that the most effective TSM actions are those that enhance the supply and attractiveness of transit and other HOVs, that reduce the number of highway lanes available to general traffic and that make it difficult for auto drivers to find a place to park at their destination.

It must be kept in mind that the Voorhees study is for an urban area as a whole. To be fully effective, the TSM controls must be applied region-wide. The important place to apply parking controls is in the regional core, and the transit improvements involved must serve the regional core.

In this perspective, the projects of several agencies have applied an effective set of TSM measures at Alewife:

- The Red Line will serve the regional core.
- The Alewife terminal will be served by a feeder bus system.
- The reduction of highway capacity from expressway standards to parkway standards at Alewife reduces the number of inbound lanes available to general traffic.
- The City of Cambridge's land use and zoning controls include stringent controls over the amount of parking permitted.

The most effective additional TSM measures applied at Alewife would be those that would support and enhance the above measures, and as the Voorhees study demonstrates, the most promising measures would be to encourage higher vehicle occupancy. The Voorhees study also suggests that if a combination of TSM strategies were applied, the reduction in vehicle miles traveled would be less than 12 percent.

How do these findings relate to the Build and No Build options for the Interim Access roads? Since the right turn volumes into Rindge Avenue Extension in the morning (and the left turn out of Rindge Avenue Extension in the evening) are the predominant constraints on the station/garage operation, the effects of the use of TSM techniques on these movements will be examined.

V. COMPARATIVE ANALYSIS OF BUILD AND NO-BUILD ALTERNATIVES USING TSM TECHNIQUES

A. Base Case: No Build-No Additional TSM

The traffic analysis at the Alewife Brook Parkway-Rindge Avenue Extension intersection, under the Base Case or No Build/No Additonal TSM option, yield the following summary information concerning the AM right turn into Rindge Avenue Extension:

MBTA Traffic	1,023
Triangle Traffic	822
Total Traffic	1,845

The term No Additional TSM is used in describing this Base Case because, as pointed out earlier, the transit highway and development projects in the Alewife area already have some TSM measures incorporated.

B. No Build with Prototypical TSM

According to the Voorhees study, the application of all categories of TSM actions except those that enhance the highway supply would result in a reduction of 11.9 percent in vehicles miles traveled. If that percentage were applied to the number of vehicles, rather than VMT, the AM right turn traffic into Rindge Avenue Extension would be reduced as follows:

	Base Case	Reduction	No Build Prototypical TSM
Base Traffic	1,023	122	901
Triangle Traffic	822	98	724
Total Traffic	1,845	220	1,625

The use of TSM actions which enhance the highway supply were not included in this calculation because they increase the vehicle miles traveled. One such TSM action - flexible work hours - is however proposed for application at Alewife.

It should also be pointed out that some of the prototypical TSM measures evaluated by Voorhees are already incorporated in Alewife projects. The 11.9 percent reduction in VMT is therefore probably unrealistically high.

C. No Build with Extraordinary TSM

The traffic studies made of the Alewife Brook Parkway-Rindge Avenue Extension intersection have found that for the right turn to be free flowing, the number of turning vehicles should not exceed 750 during the AM peak hour.

As has been demonstrated, the TSM actions, as identified, are insufficient to reduce right turn traffic volumes to a free flowing condition. The most effective TSM strategies are those which increase vehicle occupancy rates and transit market share or modal split. This leads to the question as to what vehicle occupancy rates and modal splits are necessary to reduce right turn movements to the capacity of the intersection.

The TSM strategy that MBTA could most easily implement, theoretically at least, is that relating to vehicle occupancy.

For the DEIR, 1,000 park-ride vehicles were estimated to enter in the morning peak hour with an assumed vehicle occupancy of 1.3 persons per vehicle or some 1,300 transit passengers. This is comparable to the actual experience at Wellington Station. If the strategy were to admit only entering vehicles with 2 (or more) persons per vehicle, the AM right turn traffic into Rindge Avenue Extension would be reduced as follows:

	Base Case	Reduction	No Build Extraordinary TSM #1
MBTA Traffic	1,023	358	665
Triangle Traffic	822	0*	822
Total Traffic	1,845	358	1,487

* This TSM control effects garage traffic only.

If no vehicles were admitted to the garage with fewer than 3 occupants, the right turn traffic reductions would be:

	Base Case	Reduction	No Build Extraordinary TSM #2
MBTA Traffic	1,023	580	443
Triangle Traffic	822	0	822
Total Traffic	1,845	580	1,265

It is clear that a TSM strategy which impacts garage traffic only is insufficient if the right turn movements into Rindge Avenue Extension is to be reduced to 750 vehicles in the AM peak hour. Figure 1 shows a set of vehicle occupancy ratio and mode share assumptions. It reveals that right turn movements of all vehicles with fewer than 3 occupants destined for either the triangle or the garage would have to be prohibited and the transit mode share would have to increase to 40 percent before the following reductions could occur:

	Base Case	Reduction	No Build Extraordinary TSM #3
MBTA Traffic	1,023	580	443
Triangle Traffic	822	517	305
Total Traffic	1,845	1,097	748

These volumes represent a 59 percent reduction in traffic volumes or approximately 5 times what might be expected from the application of the TSM measures according to the Vorhees Study.

Although, useful to incorporate in an evaluation of alternative approaches, this extraordinary TSM measures option contains several serious flaws:

1) Unless equally stringent controls are placed over freedom of movement on the street between Alewife and the regional core and over parking in the regional core, the low occupancy vehicles turned away from the garage would join the through traffic into the core and vehicle miles traveled would not be reduced.

2) There is no precedent for policing vehicle occupancy at an intersection with a v/c ratio of 1.35 during the peak period. But such policing would be required if low occupancy vehicles were to be prohibited from entering the triangle from Alewife Brook Parkway.

3) Justification for the assumption that the mode split could be increased from 30 percent to 40 percent has not been established.

4) If the rate of flow of vehicles into the garage is reduced to 443 in the AM peak hour, the 2,000 spaces in the garage could not be filled during the AM peak period. This would result in empty garage spaces which would mean that prospective transit riders had been denied the opportunity. Thus, this strategy would be counter to the objective of encouraging transit use.

D. Build Alternative 4 - No Additional TSM

If the Preferred Alternative were to be built and no additional TSM measures applied, the reduction in AM peak hour right turn movements into Rindge Avenue Extension would be as follows:

	Base Case	Reduction	Build/No TSM
MBTA Traffic	1,023	673	350
Triangle Traffic	822	550	272
Total Traffic	1,845	1,223	622

As Figure 2 shows, further reductions in right turn movements could be achieved if the vehicle occupancy controls were imposed over garage traffic. Such an imposition might be justified as a means for increasing transit ridership, but for purposes of freeing up the Alewife Brook Parkway-Rindge Avenue Extension intersection, it would not be necessary.

VI CONCLUSIONS

An imposing set of Transportation Systems Management measures are being applied at the Alewife area. These include the Red Line, the feeder bus system, the reduction in number of travel lanes available to traffic moving from Route 2 to Alewife Brook Parkway, and the stringent parking controls imposed by the City of Cambridge.

The full utilization of the garage is essential as a support of those TSM measures and as an additional measure that would be effective in reducing vehicle miles traveled. From the foregoing analysis, it is clear that the garage and station can best be served by direct means of access and egress which avoid the use of the critical Alewife Brook Parkway-Rindge Avenue Extension intersection.

Although not of great value in assuring the full use of the garage, additional TSM measures are available as described in this report. Their increased use in the Alewife area could be beneficial as a brake on an increase in future traffic volumes.

Within the MBTA garage, however, if vehicle occupancy controls are introduced, they should be used to increase transit ridership, not reduce traffic volumes. The full use of the Alewife garage by transit users is an important element in the overall Transportation Systems Management program for the Boston metropolitan area.

TABLE 1

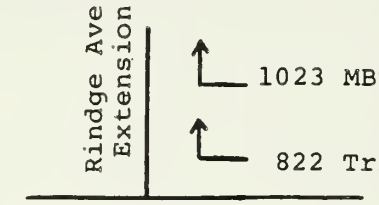
IMPACT OF TSM ACTION CLASSES ON WORK TRIP VMT AND TRAVEL TIME
FOR PROTOTYPICAL URBAN AREA OF ONE MILLION PEOPLE

TSM Strategy	Work Trip Changes After Equilibrium is Reached (in percent) VMT	Travel Time
Class A, Exclusive of Pricing Actions Which Reduce Travel Demand Ridersharing, Transit improvement, Bicycle facilities, Paratransit, Pricing incentives	-5.3	-5.3
Pricing Actions Alone	-2.4	-2.4
Class B Actions Which Enhance Highway Supply Traffic engineering, Freeway management, Truck restrictions, Flexitime	+0.6	-9.4
Class C Actions Which Reduce Demand and Degrade Supply Preferential treatment of HOV (take-a-lane), Auto restricted zones, Parking management	-6.0	-4.9
Class D Actions Which Reduce Demand and Enhance Supply Preferential treatment of HOV	-0.6	-1.4
Combined Strategies		
Class A, B, & D	-5.4	-16.1
Class A, C, & D	-11.9	-11.6
Class A, B, C, & D	-11.4	-21.0

Source: TSM, An Assessment of Impacts
Prepared for the USDOT
by A. M. Voorhees, Inc.
November 1978

NO BUILD ALTERNATE

COMBINED EFFECTS OF MODE SPLIT AND VEHICLE OCCUPANCY ON AM RIGHT TURN INTO RINDGE AVENUE EXTENSION



Base Conditions

30% - transit mode split

1.3 - vehicle occupancy ratio

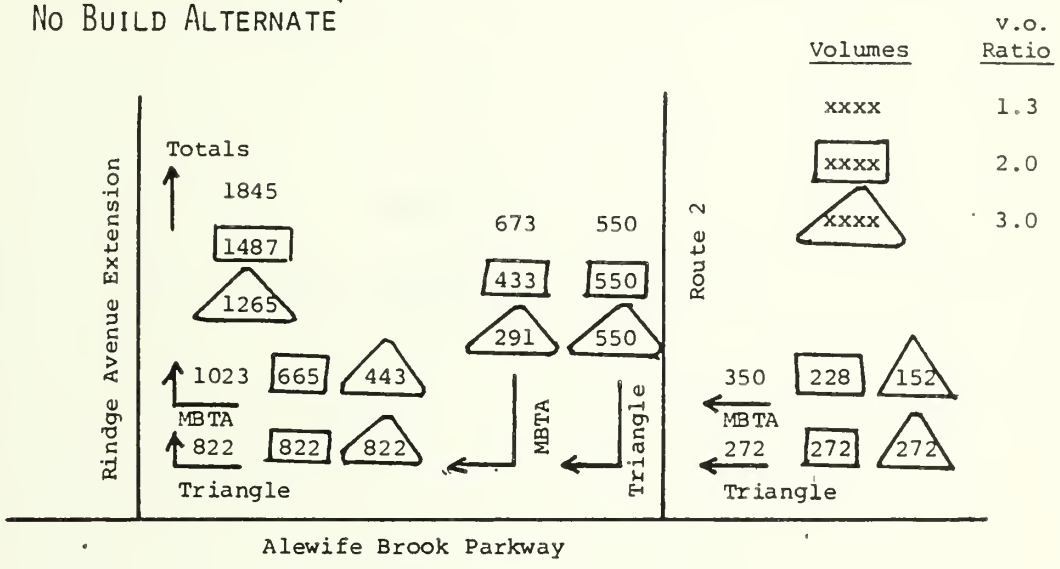
TRAFFIC VOLUME PROJECTIONS

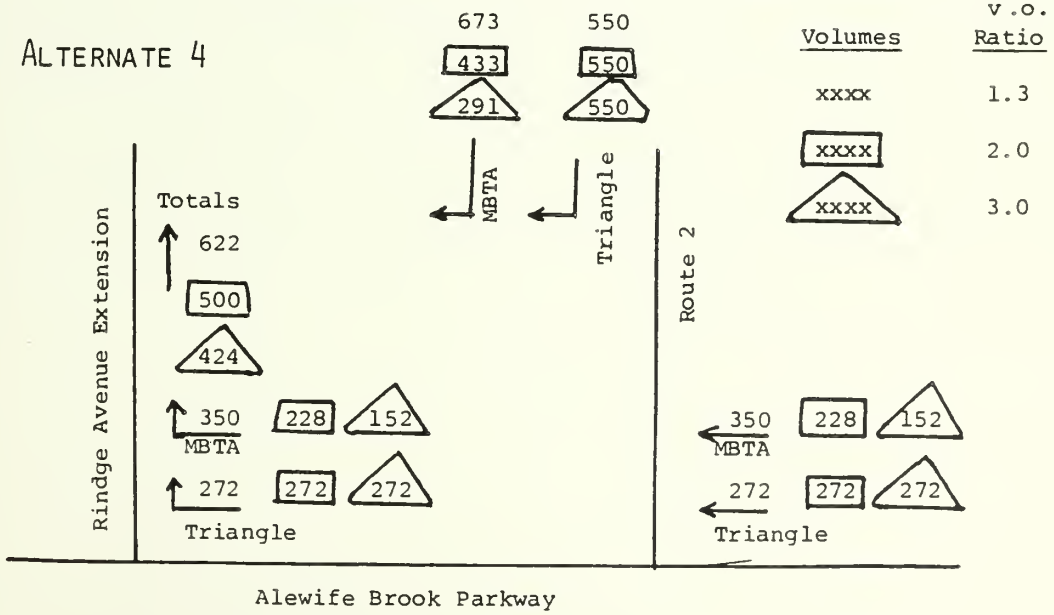
Transit Mode Share	Type of Traffic	Vehicle Occupancy Ratio			
		1.3	2.0	2.0	3.0
30%	MBTA	1023	615	532	443
	Triangle	822	533	427	356
	Total	1845	1148	961	799
40%	MBTA	1023	615	532	443
	Triangle	703	458	366	305
	Total	1726	1073	898	(748)
50%	MBTA	1023	615	532	443
	Triangle	587	381	305	254
	Total	1610	996	837	(697)
60%	MBTA	1023	615	532	443
	Triangle	469	305	244	203
	Total	1492	920	776	(646)

Notes:
- No Build Alternate has an AM right turn of 1845
- The Right Turn should be less than 750 to minimize right turn blockage
- Alternate 4 has an AM right turn of 622, with a 30% M.S. and a 1.3 V.O.
- To get the No Build Right Turn to less than 750, need M.S. & V.O. combinations as shown circled

MBTA Alewife Station Interim Access Study	NO BUILD ALTERNATE COMBINED EFFECTS OF BOTH MBTA & TRIA.	FIGURE 1

EFFECTS OF VEHICLE OCCUPANCY VARIATIONS ON JUST MBTA TRAFFIC USING THE RIGHT TURN INTO RINDGE AVENUE EXTENSION





MBTA Alewife Station Interim Access Study	EFFECT OF VEHICLE OCCUPANCY AT RINDGE AVENUE EXTENSION	FIGURE 2

APPENDIX H

INDEX TO ENVIRONMENTAL IMPACTS

APPENDIX H

INDEX OF ENVIRONMENTAL IMPACTS

APPENDIX I

COMPENSATORY FLOOD WATER STORAGE CALCULATIONS

SVERDRUP & PARCEL AND ASSOCIATES, INC
BOSTON MASSACHUSETTS

July 30, 1984

MEMORANDUM

FROM: John Mahony

PROJECT: Massachusetts Bay Transportation Authority
Alewife Interim Access Roadways

SUBJECT: Compensatory Flood Storage

The Alewife Interim Access Roadways involve filling in the flood plain and therefore result in a displacement of a volume which would have previously been available for storage of flood waters during a flood condition. This displacement is an unavoidable effect of the project.

The first mitigation approach is to reduce this displacement volume. This has been achieved by keeping the roadway as low as practical through the flood plain area and by using retaining walls wherever practical to minimize the need for side slopes which eliminate storage volume.

On the inbound roadway the road surface has been lowered as far as elevation 7.5 DPW Base, which is consistent with a less stringent 50 year flood design control rather than a 100 year flood design control, and a retaining wall, eliminating side slopes, has been provided along the south side of that roadway, facing the floodplain, from near Acorn Park Road to the northerly abutment of the bridge over the Little River.

On the outbound roadway, the road surface has also been kept as low as is reasonably possible and a retaining wall to eliminate side slopes has been provided along the north side of the roadway facing Yates Pond.

Using these reduction measures, the total storage displacement in the flood plain as a result of the access roadways has been held to 183,000 cubic feet.

The second mitigation approach is to provide Compensatory flood storage to replace the volume lost by the filling of the access roadways. This compensatory storage is provided by cutting away and removing material in another area of the flood plain so that the volume thereby made available for flood water storage equals that volume lost by filling.

The area of the flood plain located to provide this compensatory storage lies along the northerly side of the Fitchburg Freight Cutoff railroad track to the west of the Alewife Station Area. This strip of land along the railroad tracks, approximately 100 feet wide and 1,100 feet long, contains mounds to heights of as high as elevation 10 DPW Base which can be cut down to provide the required compensatory storage.

This area can be cut down to as low as elevation 3 OPW Base which is consistent with the elevation of the adjacent wetlands. In fact, it is anticipated that the lowlying area created for compensatory flood storage will assume the appearance of the adjacent marshland.

Slopes of no greater than 3 to 1 will be used to provide a more natural appearance to the area. The existing railroad embankment, which separates the undeveloped area to the north of the railroad tracks from the developed area to the south, will not be disturbed. All the area which will be regraded lies within the existing MDC Reservation.

The compensatory flood storage provided is greater than the filling due to the access roadways at all intermediate elevations between the normal water elevation of 1.6 OPW Base and the 100 year flood elevation of 8.3 DPW Base. At the 100 year flood elevation of 8.3 OPW Base, the limiting case, the Compensatory flood storage provided is 185,000 cubic feet, slightly greater than the total flood storage displacement due to filling of 183,000 cubic feet.

Attachments:

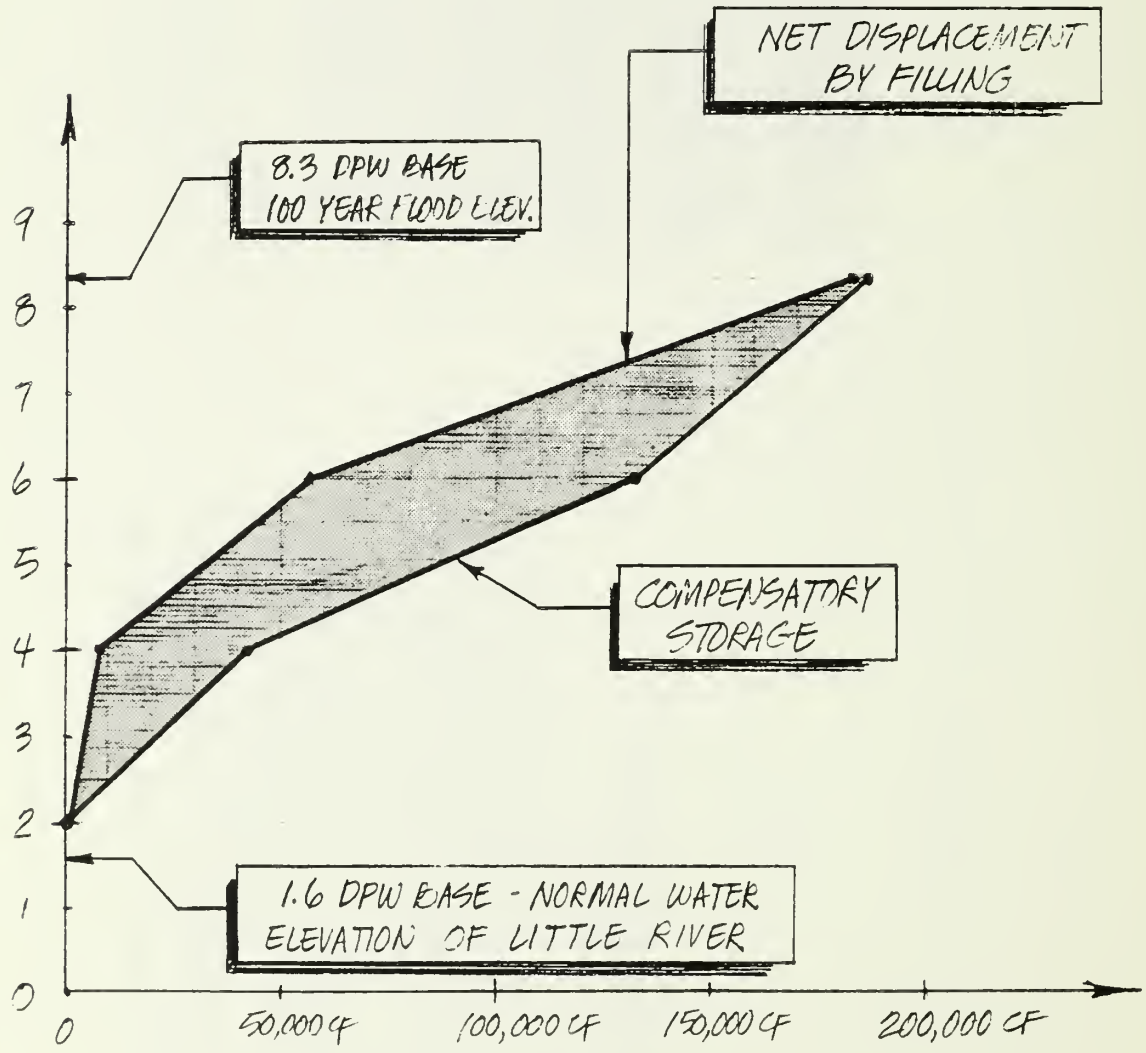
- Compensatory Flood Storage Calculations (4 Sheets)
- Plan of Easterly Section of Compensatory Flood Storage Area
- Plan of Westerly Section of Compensatory Flood Storage Area

SVERDRUP & PARCEL

JOB ALEWIFE INTERIM ACCESS SHEET NO 1 OF 4

COMPUTATIONS FOR COMPENSATORY FLOOD STORAGE DATE JULY 30, 1974 BY JTV CHKD

At all elevations between the normal water elevation in the area (1.6 DPW Base) and the 100 Year Flood Elevation (8.3 DPW Base), the compensatory storage provided is greater than the net displacement due to filling from the project.



ALLWIFE INTERIM ACCESS
REVISED JULY 13, 1994

	BELOW ELEVATION 2 (CMDPW BASE)				BELOW ELEVATION 4 (MHW BASE)				BELOW ELEVATION 6 (CMDPW BASE)				BELOW ELEVATION 9.5 (CMDPW BASE) THIS IS THE 100 YEAR FLOOD ELEVATION			
	END AREAS		VOLUMES		END AREAS		VOLUMES		END AREAS		VOLUMES		END AREAS		VOLUMES	
	FILL	CUT	FILL	CUT	FILL	CUT	FILL	CUT	FILL	CUT	FILL	CUT	FILL	CUT	FILL	CUT
LISTERLY COMPENSATORY FLOOD STORAGE AREA																
STATION 0-40	1	0	0	0	0	0	0	1,560	1	0	1	4,565	0	0	0	4,560
0+00		0	0	0	0	22	1	7,100	0	228	2	20,250	0	228	0	22,200
1+00	1	1	1	0	1	64	1	7,000	0	189	0	18,750	0	216	0	22,000
2+00	1	1	1	1	0	76	1	8,000	0	186	0	20,400	0	224	0	26,700
3+00	0	0	1	0	0	84	0	4,200	0	222	0	18,150	0	310	0	29,200
4+00	0	0	0	0	0	0	0	0	0	140	1	7,000	0	274	1	13,700
STATION 4+15	0	0			0	0			0	0			0	0		
			0 CF	0 CF			0 CF	27,360 CF			0 CF	89,660 CF			0 CF	118,360 CF
WESTERLY COMPENSATORY FLOOD STORAGE AREA																
STATION 0-50	0	0	0	0	0	0	0	1,750	0	0	1	4,650	0	0	0	15,400
0+00	0	0	0	0	0	70	1	7,200	1	186	0	18,000	0	300	0	28,150
1+00	0		0	0	0	74	0	4,450	1	174	0	12,000	0	255	0	16,750
2+00	0		0	0	0	15	0	750	0	66	0	4,800	0	80	0	5,500
3+00	0		0	0	0	0	0	0	0	30	0	1,500	0	30	0	1,500
STATION 4+00	0	0			0	0			0	0			0	0		
			0 CF	0 CF			0 CF	14,150 CF			0 CF	40,750 CF			0 CF	67,300 CF
TOTAL OF TWO FLOOD STORAGE COMPENSATION AREAS			0 CF				42,010 CF				130,610 CF				185,660 CF	
TOTAL REQUIREMENT			0 CF				8,315 CF				56,325 CF				183,188 CF	

ALEWIFE INTERIM ACCESS
515211 JULY 12, 1984

OUTBOUND ROADWAY
FLOOD STORAGE DISPLACEMENT

STATION	BELOW ELEVATION 2 (MDPW BASE) END AREAS (SF) FILL	CUT	VOLUMES (CF) FILL	CUT	BELOW ELEVATION 4 (MDPW BASE) END AREAS (SF) FILL	CUT	VOLUMES (CF) FILL	CUT	BELOW ELEVATION 6 (MDPW BASE) END AREAS (SF) FILL	CUT	VOLUMES (CF) FILL	CUT	BELOW ELEVATION 8.3 (MDPW BASE) THIS IS THE 100 YEAR FLOOD ELEV. END AREAS (SF) FILL	CUT	VOLUMES (CF) FILL	CUT	DEPTH AT ℄ (FEET) FILL	CUT
1+00	0	0			0	0			0	0			0	0			–	–
							0	0			300	0			4,750	0		
2+00	0	0			1	1			6	0			95	0			2.0	–
			0	0			250	0			1,100	0			9,750	0		
3+00	0	0			5	0			16	0			100	0			1.6	–
			1	0			250	0			1,000	0			8,500	0		
4+00	0	0			0	0			4	0			70	0			0.8	–
			1	0			300	0			2,200	0			6,200	0		
5+00	0	0			60	0			40	0			54	0			0.2	–
			0	0			300	0			2,000	0			4,200	0		
6+00	0	0			0	0			0	0			30	0			1.0	–
			0	0			0	0			0	0			3,800	0		
7+00	0	0			0	0			0	0			46	0			1.4	–
			0	0			200	0			1,000	0			8,550	0		
8+00	0	0			4	0			20	1			125	0			2.0	–
			1	0			200	0			1,000	0			11,050	0		
9+00	0	0			0	0			0	0			96	0			2.0	–
			0	0			0	0			0	0			5,950	0		
10+00	0	0			0	0			0	0			23	0			1.6	–
			0	0			0	0			0	0			2,750	0		
11+00	1	0			0	0			6	0			32	0			5.5	–
			0	0			0	0			1,300	1			10,800	0		
12+00	2	0			0	0			26	0			184	0			11.0	–
			0	0			0	0			1,300	0			9,200	0		
13+00	0	0			0	0			0	0			0	0			–	–
TOTALS			0 CF	0 CF			1,500 CF	0 CF			11,200 CF	0 CF			85,500 CF	0 CF		

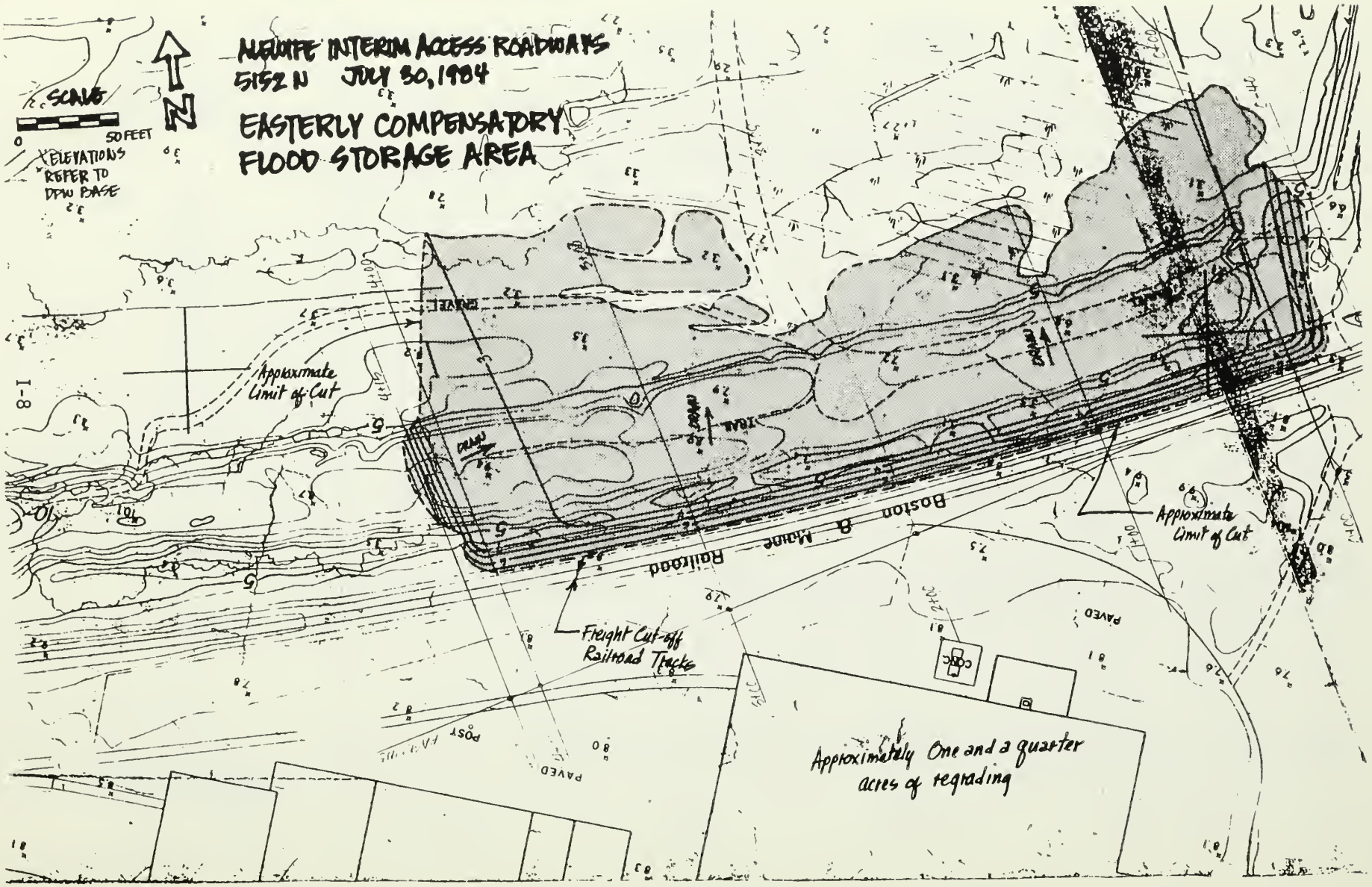
ALEWIFE INTERIM ACCESS
3152 II JULY 12, 1984

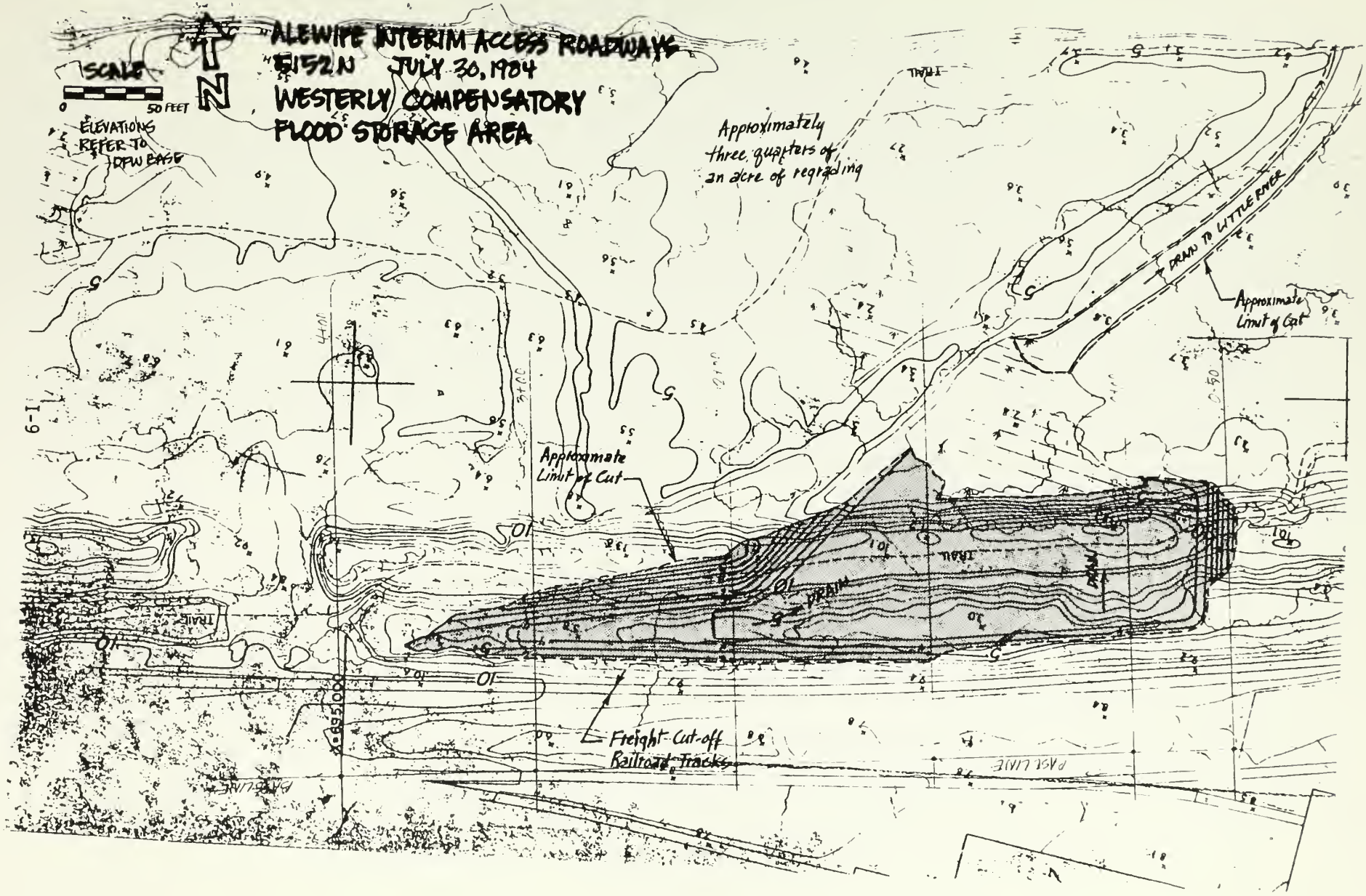
INBOUND ROADWAY

FLOOD STORAGE DISPLACEMENT

	BELOW ELEVATION 2 (MEAN RANGE)				BELOW ELEVATION 4 (MEAN RANGE)				BELOW ELEVATION 6 (MEAN RANGE)				BELOW ELEVATION 8.3 (MEAN RANGE) THIS IS THE 100 YEAR FLOOD ELEV.				DEPTH AT ∮ (FEET)	
	END AREAS (SF)		VOLUMES (CF)		END AREAS (SF)		VOLUMES (CF)		END AREAS (SF)		VOLUMES (CF)		END AREAS (SF)		VOLUMES (CF)			
	FILL	CUT	FILL	CUT	FILL	CUT	FILL	CUT	FILL	CUT	FILL	CUT	FILL	CUT	FILL	CUT	FILL	CUT
STATION 0+00	0	0			0	0			0	0			0	0			-	-
1+00	0	0	0	0	0	0	0	0	0	0	0	0	86	0	4,300	0	1.5	-
2+00	0	0	0	0	0	0	0	0	27	0	1,350	0	150	0	11,800	0	2.8	-
3+00	0	0	0	0	0	0	0	0	52	0	3,950	0	120	0	13,500	0	3.0	-
4+00	0	0	0	0	8	0	400	0	78	0	6,500	0	150	0	13,500	0	2.8	-
4+35 BRIDGE ABUTMENT	0	0	0	0	10	0	315	0	90	0	2,940	0	156	0	5,355	0	3.5	-
4+87 BRIDGE ABUTMENT	0	0	0	0	40	0	0	0	123	0	0	0	164	0	0	0	4.0	-
5+00	0	0	0	0	0	0	200	0	44	0	1,085	0	118	0	1,833	0	2.0	-
6+00	0	0	0	0	0	0	0	0	83	0	6,350	0	132	0	12,500	0	2.8	-
7+00	0	0	0	0	57	0	2,850	0	138	0	11,050	0	172	0	15,200	0	4.8	-
8+00	0	0	0	0	0	0	2,850	0	6	0	7,200	0	12	18	9,200	900	-	8.2
9+00	0	0	0	0	0	0	0	0	2	0	400	0	6	25	900	2,150	-	7.6
10+00	0	0	0	0	0	0	0	0	0	0	100	0	8	24	700	2,450	-	4.5
11+00	0	0	0	0	0	0	0	0	0	0	0	0	24	0	1,600	1,200	-	1.4
12+00	0	0	0	0	0	0	100	0	0	0	1,000	0	44	0	4,450	0	4.0	-
13+00	0	0	0	0	2	0	100	0	20	0	2,100	0	65	0	6,400	0	5.8	-
STATION 14+00	0	0	0	0	0	0	0	0	22	0	1,100	0	63	0	3,150	0	4.0	-
	0	0			0	0			0	0			0	0				
TOTALS			0 CF	0 CF			6,815 CF	0 CF			45,125 CF	0 CF			104,388 CF	6,700 CF		
NET STORAGE DISPLACEMENT			0 CF				6,815 CF				45,125 CF				97,688 CF			

I-7


MULTIPE INTERIM ACCESS ROADWAYS
5152 N JULY 30, 1984
EASTERLY COMPENSATORY
FLOOD STORAGE AREA
SCALE
0 50 FEET
ELEVATIONS REFER TO DPW BASE
N
Approximate Limit of Cut
Boston & Maine Railroad
Freight Cut-off Railroad Tracks
Approximate Limit of Cut
Approximately One and a quarter acres of regrading
I-8


ALEWIFE INTERIM ACCESS ROADWAYS
5152N JULY 30, 1984
WESTERLY COMPENSATORY
FLOOD STORAGE AREA
SCALE
0 50 FEET
N
ELEVATIONS REFER TO DPW BASE
Approximately three quarters of an acre of regrading
DRAIN TO LITTLE RIVER
Approximate Limit of Cut
Approximate Limit of Cut
Freight Cut-off Railroad Tracks
TRAIL
PAGE LINE
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